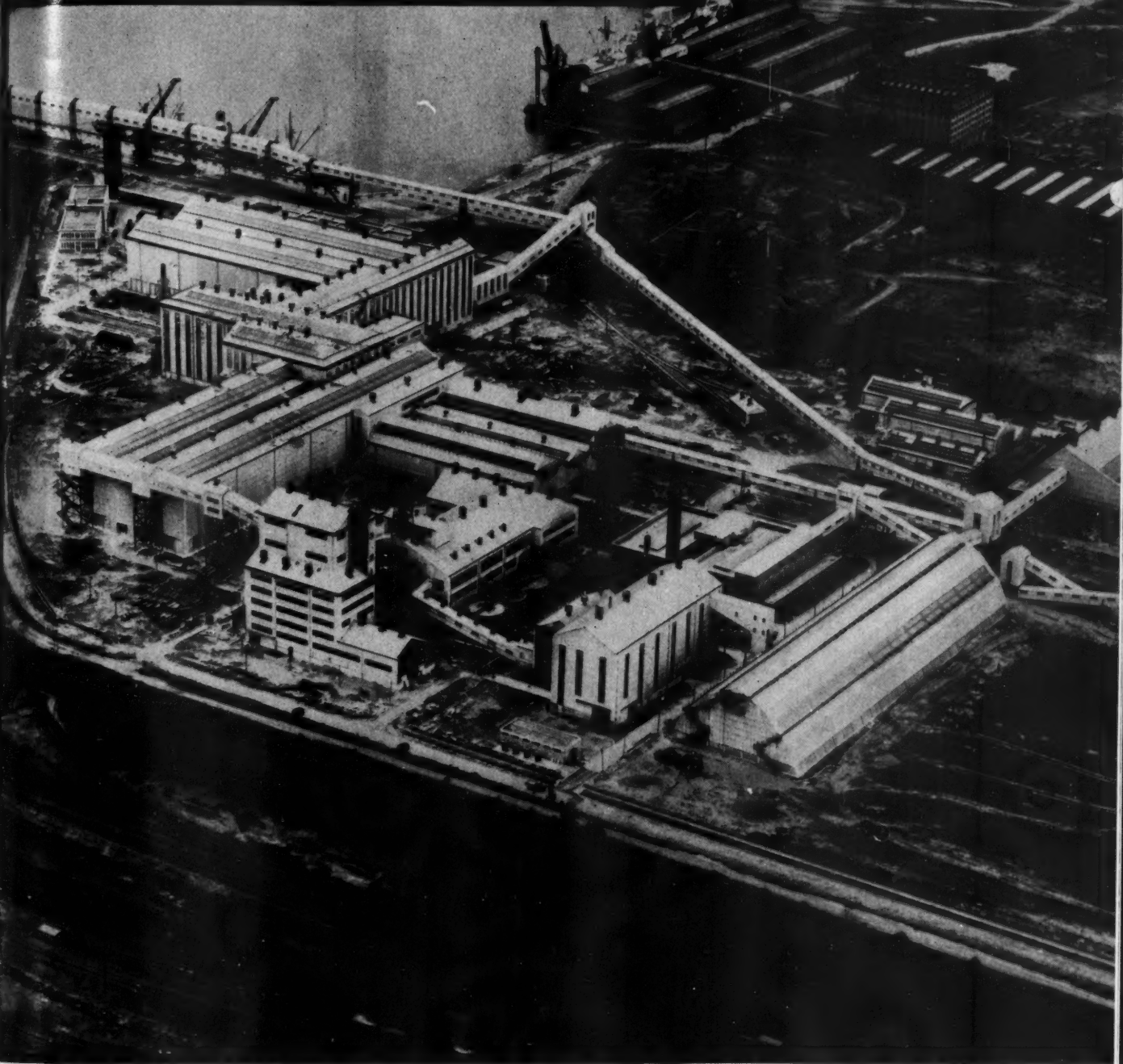


arm Chemicals



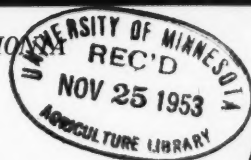
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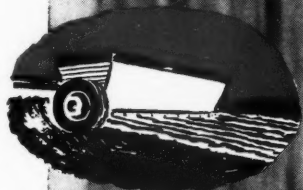
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NOVEMBER, 1953

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In this issue . . .

Wetting agents for fertilizer mixes haven't been entirely successful in their first year of use, Dr. Vincent Sauchelli, of Davison Chemical Corp., reports. But they do have a number of advantages that make their use economically worthwhile, as the report of his recent talk before pesticide control officials shows. Turn to page 10.

Pesticides for growers in eastern Arkansas have been provided — and fast — by California Spray-Chemical Corp.'s new plant in Pine Bluff. The plant, representative of Calspray operations across the country, is described and pictured on page 13.

No rest for the weary. That's the plight of the fertilizer and pesticide control official, who has two new problems to replace every one he solves. At least, with developments in the farm chemicals field complicating his activities every year, it seems that way. Control officials in both fields from all parts of the country discussed their problems and activities in recent sessions in Washington, D.C. For the FARM CHEMICALS picture report on the conventions, turn to page 14 for fertilizer, 19 for pesticide.

Everybody is worried about the rough time most farmers had this season, what with the drought, higher expenses and lower prices. The National Fertilizer Association naturally is concerned about the situation, which most likely will come in for a big share of the discussion at the 27th annual southern fall meeting of the association Nov. 16-18. Story and program schedule on page 26.

Surfactants for pesticide emulsion formulas are complicated. That's why you should be interested in the handy selector developed by Atlas Powder Co. See page 29.

Latest techniques in ammoniation, as embodied in TVA's new continuous ammoniator, were shown to interested members of the fertilizer industry in September. A report on the tour of the equipment starts on page 30.

Biggest year of expansion was marked recently by members of Smith-Douglass Co., Inc. at Norfolk, Va. Read why the company considers the past 12 months the most important in the history of the organization. Page 36.

Unique Door Co. method for manufacturing granulated triple superphosphate using a mixture of sulfuric and phosphoric acids is described in detail in the article starting on page 38. The method is in operation at the Immingham Triple Superphosphate plant near Grimsby, Lincolnshire, England.

There will be many exhibits of interest to members of the farm chemicals industry at the Exposition of Chemical Industries set for Philadelphia Nov. 30 to Dec. 5, according to advance registration. For a brief account of the exposition plans, turn to page 48.

NOVEMBER, 1953

farm chemicals

Formerly
American Fertilizer & Allied Chemicals

Established 1894

PIONEER JOURNAL OF THE FARM CHEMICALS INDUSTRY

Vol. 116

NOVEMBER, 1953

No. 11

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Cover Story

The Dor Company, of Stamford, Conn., developed the process for manufacturing granulated triple superphosphate in the Fisons, Ltd., plant in England. Cover photo shows aerial view of the unit, which is described in the story starting on page 38.

A magazine international in scope and circulation and devoted to manufacturers, mixers, and formulators of fertilizers and pesticides



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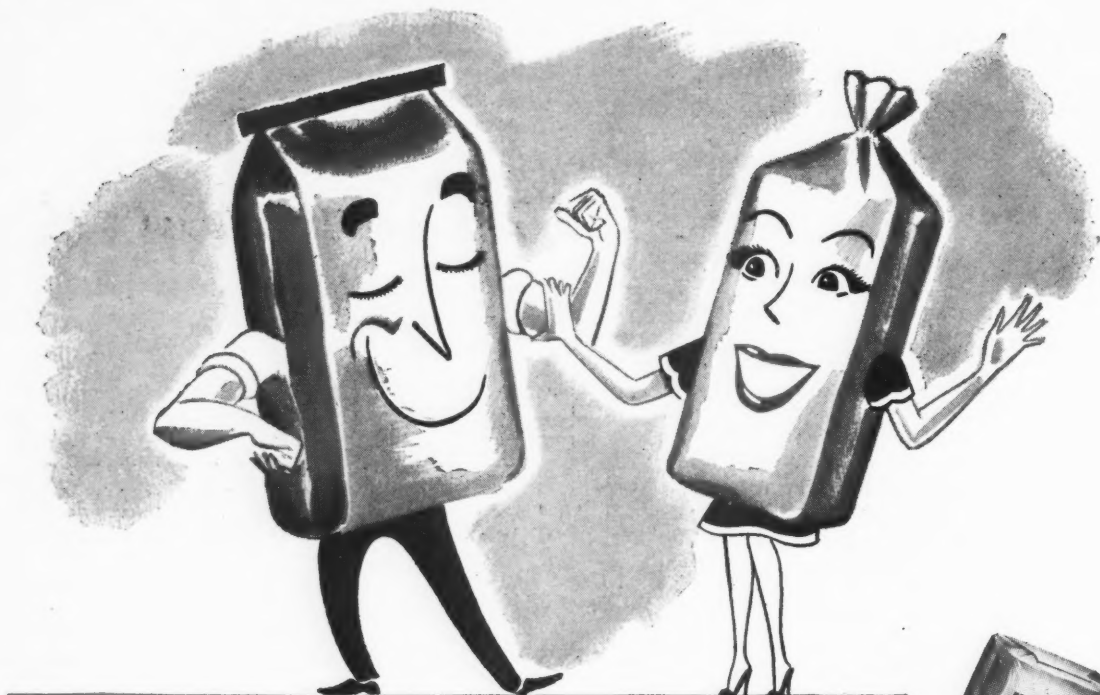
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Sewn
Valve Type



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Pasted Bottom



Open Mouth
Sewn Bottom

FARM CHEMICALS

farm chemicals facts

... Briefly Noted

N. L. Amend has been named manager of the Industrial Organic Chemicals Sales department of the Michigan Alkali division, Wyandotte Chemicals Corp.

Amend formerly was assistant manager of the Organic Chemicals Sales department. Prior to joining Wyandotte, he was in the Special Products department of Buffalo Electric Chemical Co.



Amend

Wyandotte says its growth in the field of organic chemicals is responsible for the establishment of the new department.

C. M. Hickey, former general superintendent of plants in Consolidated Chemical Industries, Inc.'s Southern division, has been appointed manager of manufacturing. A chemical engineering graduate of Rice Institute, Hickey has been with the company since 1924. His headquarters will continue to be in Houston.

Director of industrial relations for Grace Chemical Co.'s \$19 million nitrogen plant under construction near Memphis is **Peter D. Chabris**, a former employe of American Telephone and Telegraph Co.

American Wheelabrator & Equipment Corp. has named **Leroy J. Wieschaus** district manager of its Birmingham sales office. Wieschaus, a registered professional engineer, has held positions as market research engineer, assistant sales promotion manager and abrasives engineer with the company.

Luther Evans has been named director of industrial relations for Dow Chemical Co. Prior to his promotion, he had been in charge of industrial relations for the company's Texas division.

Died: **George C. Schurr**, 51, on Sept. 28. He had been connected with Farm Bureau for 27 years, and at the time of his death was serving as manager of the bureau's fertilizer plant at Maumee, O.

NOVEMBER, 1953

New control manager of Du Pont's Grasselli Chemicals department in Wilmington, Del. is **Eugene Cashman**.

Franklin Johnson has been named superintendent of Carbide and Carbon Chemicals' Research and Development department.

Cecil W. Humphreys now is vice president in charge of manufacturing for Shell Chemical Corp. Previously, he had been general manager and manager of development for Shell's manufacturing department.

G. A. Webb has been appointed assistant to the manager of Koppers Co., Inc.'s research department. He formerly was executive secretary of the new products committee.

Beckman Instruments, Inc. has named **John M. Manypenny** its eastern district manager. He will take charge of sales and service of Beckman products throughout the eastern states, with headquarters at the company's plant in Mountainside, N. J.

Newly elected director of Grace Chemical Co. is **Dr. Ralph N. Lulek**. He also has been named vice president of manufacturing and research.

Charles Gronda recently resigned as vice president of Hudson Pulp & Paper Corp. Recently, he has been supervising the design and construction of American Israeli Paper Mill in conjunction with Merritt-Chapman, Scott Corp.

Joseph E. Lee has been promoted to sales manager of McLaughlin Gormley King Co.'s Chemical division. He joined the company in 1948 as a sales representative in the Chicago district. Lee will make his headquarters in the company's general offices at Minneapolis, Minn.

Chase Bag Co. has promoted **J. B. Trigg** to sales manager of its Buffalo branch. He went to Chase in 1939 following his graduation from Grinnell College.

Thomas P. Garraway has joined the Development department of Monsanto Chemical Co.'s Phosphate division.

Velsicol Corp.'s new traffic manager is **William M. Spaulding**, former assistant general freight agent of Chicago Rock Island & Pacific Railroad.



Spaulding

Spaulding has been active in many cases and hearings before the Interstate Commerce Commission, as well as state and local commerce boards and groups. He also has served as traffic manager with Pettibone-Mulliken Co. and Continental Can Co.

Trevor A. Steele has joined the sales staff of American Potash & Chemical Corp. as regional agronomist. Formerly he was regional agronomist for the Civil Aeronautics Authority in the Pacific Northwest.

Donald V. Sarbach has been named technical manager of the New Products Development department, B. F. Goodrich Co. Prior to his transfer he had been manager of Goodrich's General Chemical Laboratories.

Recently elected vice president and executive committee member of Rohm & Haas Co. is **John C. Haas**. He formerly was assistant plant manager at Knoxville, Tenn. and Houston, Tex.

CALENDAR

Nov. 9-10—Cal. Fert. Assn. annual meeting, Carmel, Cal.

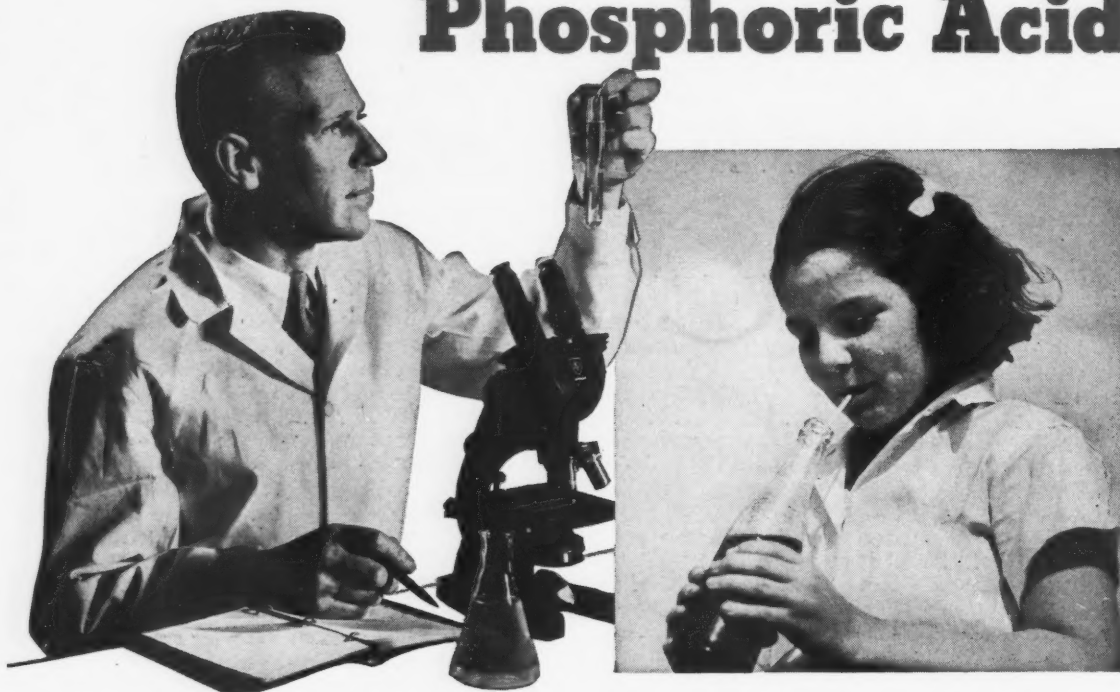
Nov. 16-18—NFA fall meeting, Atlanta, Ga.

Nov. 30-Dec. 5—Chem. Ind. Exposition, Philadelphia, Pa.

Dec. 6-8—CSMA annual meeting, Washington, D. C.

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Farm Chemicals

Washington Report

By Fred Bailey & John Harms

Tolerances on the Way

Residue tolerances for more than 100 pesticides used on fruits and vegetables may yet be proclaimed by the government before year's end. A proposed order was being considered, as we went to press, in the office of Secretary Oveta Hobby, Department of Health, Education and Welfare. Food & Drug Administration finished its work on the order recently.

The order appears imminent . . . insiders believe it will be announced in November, although something could come up to delay it.

Tolerances in the order are expected to be issued initially as "proposals" for more than 100 pesticides. Presumably they will be subject to change if opposition develops. High FDA officials tell us hearings would not be required if tolerances are contested as proposed. Under present law, if FDA refused to change an opposed tolerance . . . it could be appealed in the U. S. Circuit Court of Appeals.

FDA officials believe that tolerances announced before the Miller bill is acted upon . . . which also sets up methods to control pesticides . . . would not result in complications if the bill is passed as now written. The Miller bill, pending in the House Commerce committee, contains provisions prohibiting any retroactive application of the legislation to tolerances announced earlier.

There is one apparent hitch to this, however. Officials explain it this way: If the Miller bill should be in effect while one of the proposed tolerances for pesticides in the current order has not yet become final . . . an appeal against the proposed tolerance would have to be made through the industry advisory committee provided in the Miller bill.

This would be interpreted as an improvement for the appellant inasmuch as the courts are limited to overruling administrative decisions on pesticide tolerances only if they can be proven to be "arbitrary" or capricious.

Surprising thing is that the FDA tolerances have reached the order stage at all. It was generally expected here they would be held up until the fate of the Miller bill was decided sometime next spring.

As things look now . . . if the order is issued soon . . . tolerances to cover more than 100 of the newer pesticides very probably will have been set before the Miller bill is likely to be passed. This would save applications for them at FDA under any new legislation which could have required new proceedings all over again.

While the order has not yet been made official, we can reveal some of the important points you can look for when it is announced.

The proposed order . . . in the eyes of Health Department officials . . . is not expected to change substantially the tolerances generally permitted under the agreement between the Agriculture Department and the FDA. This informal agreement has been serving until official tolerances could be determined.

Residue of some of the pesticides will not be established at all. These would be pesticides which would disappear if applied according to spray schedules.

Two or more of the most toxic pesticides which earlier faced a "no tolerance" prospect WILL get tolerances. But chances are they won't be regarded as satisfactory and probably will be appealed.

In the wind: The chemical industry likely will be asked to defray at least part of FDA's cost of handling tolerance schedules . . . work done on them by the government.

Acreage Cuts and Fertilizer Usage

The near 25 per cent cut-back in cotton acreage . . . to 17.9 million acres . . . ordered by the Agriculture Department for next year is not expected to cut down on fertilizer consumption on this major use-crop. There are two reasons seen by officials here: (1) The poor-yield acres will be taken out of production, and (2) more fertilizer likely will be used to increase yields to make up for "lost" acres. Big fertilizer-use area of Southeast loses only about 12 per cent of its acres in the cut-back . . . western cotton areas, however, get decrease of more than 38 per cent.

But cotton acres under government controls will be increased . . . especially for the West. Congressmen tell us that they plan to boost the acreage permitted for cotton in that area . . . "to relieve hardship under the present law." But don't look for much if any increase for the South.

Number of cotton acres fertilized this year is estimated by the Bureau of Agricultural Economics at about 14.2 million. Biggest users are South Carolina, Georgia, Alabama, Mississippi, Arkansas and Texas.

No Place to Go But Up

Many of the economists attending the USDA's annual Outlook Conference believe that farmers have hit the bottom in the two-year farm recession since Korean income peaks. While they don't look for any big surge upward . . . they do not believe that farmers' position will become much worse next year.

What this means to the farm chemicals trade is that farm selling will continue to be about as fluid as it was this year . . . not much more sticky. Demand for fertilizer is expected to continue high . . . despite forced government cut-backs on acres used for the big food plant users. Pesticide demand will be governed more by the kind of pest season we have next year.

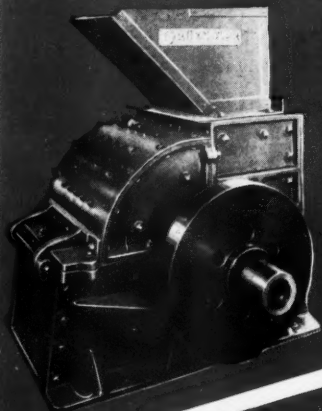
Note: Some of the agricultural soothsayers are looking for a slight comedown of the farm price of most chemicals next year.

No big national recession is seen for the country as a whole in 1954 by the Outlook Conference . . . which has a fair reputation for being accurate. "Reasonably" boomy times of this year are expected to carry over through the first six months of 1954. After that, the economists are more vague. They think there will be some more sliding off . . . more unemployment, fewer homes built, more business failures, etc. But this, they say, will be getting more back to normal . . . really not much to worry about. But it is something to watch closely.

Agriculture Secretary Benson will stay . . . at least for the time being. That's the verdict reached recently at an unpublicized meeting at the White House. At the same meeting, the President decided to lay his prestige on the line for his farm leader.

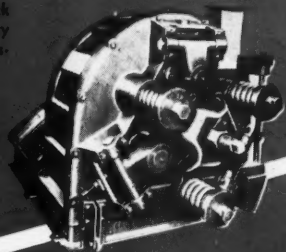
Taking the Pressure Off Benson

How successful Eisenhower was in last month's speech at the Future Farmers convention in lifting the pressure for a change in the farm cabinet job . . . put on by some GOP congressmen . . . won't be known until Congress comes back in January. Some of these congressmen have been telling the White House that Benson's demands for less farm reliance on government bounty at a time when prices were falling could lose GOP control of the House in the 1954 election.



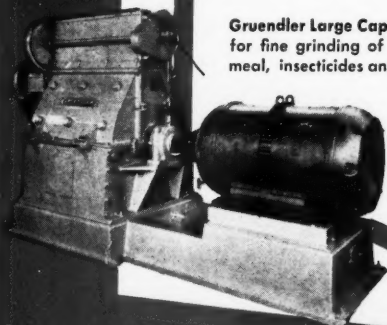
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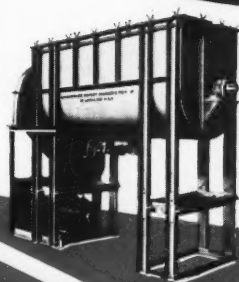
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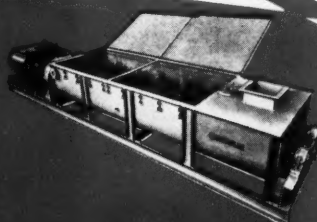


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Surfactants

On Trial



Dr. Vincent Sauchelli addressing AEPCO on surfactant use.

Sauchelli describes experiments
to fertilizer control officials

SURFACTANTS are on trial; they need careful consideration and testing before all the facts will be known about their use."

That was the conclusion of Dr. Vincent Sauchelli, director of agricultural research at Davison Chemical Corp., in a talk which outlined the advantages and drawbacks of the wetting agents in the manufacture of fertilizers.

Talk to Control Officials

Dr. Sauchelli's remark was included in a talk entitled "Present Status of Surface Wetting Agents for Fertilizer Use." It was presented at the convention of the Association of American Fertilizer Control Officials in the Shoreham Hotel, Washington, D.C., last month. (See page 14.)

"A research program is needed to determine how, when and what surfactant to use," he added.

Basis of Dr. Sauchelli's talk was a round table discussion by industry and government leaders which he attended at the recent American Chemical Society meeting in Chicago. The speaker reported on industry tests with wetting agents at plants in Tennessee and in Ontario, Can., and on government research with surfactants at the USDA plant in Beltsville, Md.

Dr. Sauchelli emphasized that most data indicates no one surfactant or class of surfactants will solve all problems. He suggested that further research be conducted on a cooperative basis between industry and government chemists.

Advantages of Surfactants

Summarizing the reports of the three tests with the wetting agents, he listed these advantages in fertilizer manufacture:

1. In manufacture of superphosphate a more efficient use of acid may be possible.
2. Softer and dryer superphosphate may be possible with less fouling of equipment.
3. Use of higher strength acid may be possible.

4. In mixed fertilizers, more efficient ammoniation may be expected.

5. Less caking and lower moisture content of materials.

The surfactants appear to have their most important application in the production of superphosphate, according to Dr. Sauchelli. He stated that the economics of surfactant use was a complex subject and should be studied further. He said many manufacturers are unknowingly using surfactants in their

Photo shows the appearance of free-flowing mixtures when they contain a surface active agent.



manufacturing process now.

Unknown Agents

During the flotation process in recovery, the film on the surface of phosphate rock acts in this manner, he reported. Another inadvertent use is with spent acid used in production, which contains materials acting as wetting agents.

First widespread interest in the agents was noted about a year ago, Dr. Sauchelli told the control officials, when one manufacturer reported using wetting agents to prevent caking in his fertilizer mixes.

Typical claims made for the agents include quicker curing time (reduced from 30 to three days in some instances) with less storage space required, less water needed during ammoniation and more complete penetration of acid during acidulation.

He stressed the fact that the surfactants are not to be considered as conditioners but as "valuable aids in processing."

Tennessee Plant

Reporting on the commercial production of fertilizer in the Tennessee plant, Dr. Sauchelli said an improvement in the conversion of P_2O_5 was noted. He said an improvement was seen in the physical condition of superphosphate and that there was a more efficient dispersion of ammonia during the ammoniation process, but that this dispersion was difficult to measure precisely.

So far as physical conditions of mixed fertilizer are concerned, the Tennessee production showed, under certain conditions of climate and manufacture, improvements were noted.

Unfavorable Report

A much less favorable report was given in the Ontario plant, according to the speaker. He said that tests there showed the surfactants didn't reduce curing time or ammonia gas leakage and had no appreciable effect on caking, although the lumps were softer.

"No significant benefit from using surfactants was noted at the Ontario plant," Dr. Sauchelli stated. He added that use of the agents "was not justified considering the costs of the materials," but that the Ontario representative



James E. Seymour, chief chemist at Illinois Farm Supply Co. plant at East St. Louis, Ill., who conducted early experiments using surface active agents in fertilizer, works with a fertilizer batch in laboratory.



Compare the free-flowing quality of the fertilizer on the right, which was treated with surface active agents, with the untreated material.

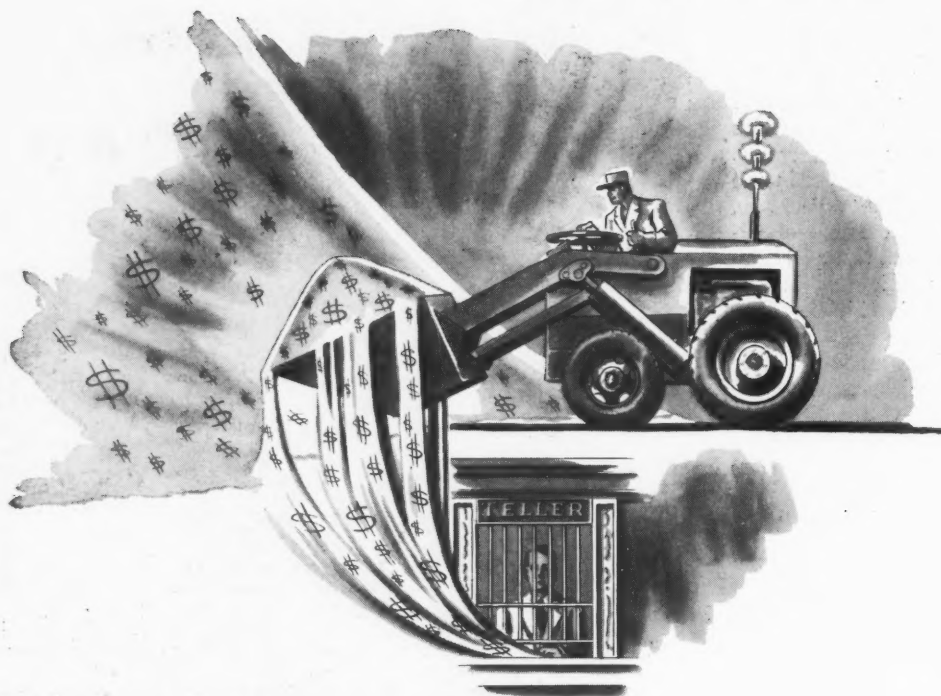
said his company was interested in continuing studies with the agents.

The Beltsville research, conducted by scientists at USDA, indicated that nonionic agents gave more favorable results than ionic types in the acidulation of phosphate rock.

Den superphosphate made with a surfactant also was softer than

with conventional acidulation.

The Beltsville experiments showed that effects of surfactants are more physical than chemical and that the accelerated rate of acidulation and curing probably will be of most advantage to industry during periods of peak production of fertilizers. ♦



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Quality sells your mixed goods, and top quality is assured with Tennessee's SUL-FON-ATE AA9 for accelerated conditioning.

Economy—High active Tennessee SUL-FON-ATE AA9 means real savings in active ingredient unit cost.

Tennessee's **SUPER-ACID** for acidulation gives superior conditioned superphosphate, quick curing, soft piles, and high analysis.

New—For those who prefer a lower active product, Tennessee is now producing SUL-FON-ATE AA4 (40% active).

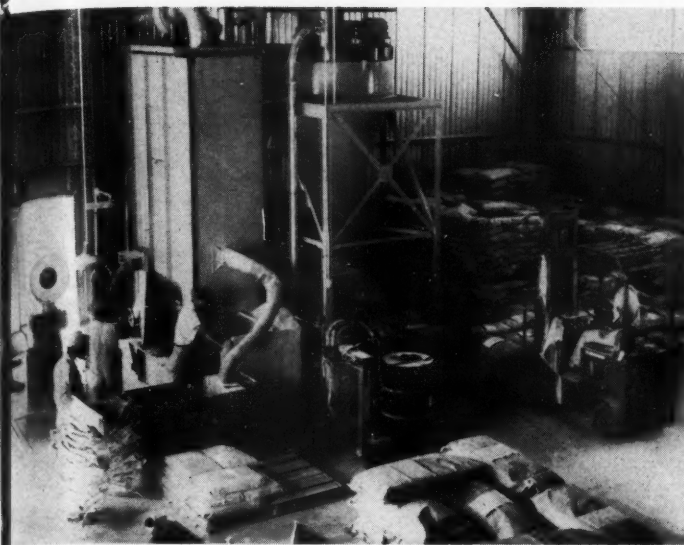
Technical service is available to help you with your problems.

ORGANIC CHEMICALS DIVISION
TENNESSEE  CORPORATION

617-29 Grant Building, Atlanta, Georgia

Serving Arkansas . . .

New Calspray Plant



Raw ingredients are fed into dust mill at left. Towmotor palletizes finished products (right).

DELIVERY of important pesticides to growers in eastern Arkansas has been greatly speeded by construction of California Spray-Chemical Corp.'s new plant in Pine Bluff.

In periods of unusual demand for the chemicals, the company states, the plant is capable of servicing northern Louisiana, western Arkansas, western Tennessee and the Mississippi Delta area.

The 7,000-square-foot building houses equipment capable of producing 300 tons of dusts a week in addition to warehouse capacity for 500 to 700 tons of material.

The new plant is representative of Calspray operations in various localities from coast to coast, the company told FARM CHEMICALS.

Other Plants

In addition to the three primary manufacturing points, Richmond, Cal., St. Louis, Mo. and Elizabeth, N. J., Calspray now operates more than 40 dust mills comparable to the Pine Bluff establishment.

According to Calspray spokesmen, dust mill building will continue as fast as possible until all important agricultural areas in the country are assured an immediate source of farm chemical supplies.

Greatest demand in the Pine Bluff area is for dust formulations to control cotton insects, namely Gammacide Cotton Dust formula-



Operations began early this summer in the 7000 square foot plant. In addition, there is warehouse space for up to 750 tons of material.

tions 3-5-40, 3-10-40, 3-5 and 3-10.

Also used for cotton insects are the following dusts: Alltox 20, Alltox-S 20-40, Ortho Aldrin, Ortho Dieldrin, Ortho-Mite and Persisto.

Many Formulations

The plant is equipped to formulate dusts containing BHC, DDT, toxaphene, parathion, aramite, chlordane, DDD, lindane, dilan, etc. in addition to the specifics for cotton.

Also manufactured are fungicidal dusts containing Orthocide-Captan and Zineb along with combinations of these fungicides with insecticides.

In the few months since the plant was opened in early summer more than 25 dust formulations have been produced.

Warehouse stocks of liquid insecticides, including DDT, BHC, toxaphene, aramite, lindane, DDD, TEPP, parathion and others are

maintained at the new plant, along with approximately 100 small package products. These include garden and home items.

Seed Treatments

Seed treatment formulations containing Orthocide-Captan, lindane and combinations of these chemicals also are stored at the Pine Bluff structure. According to J. T. Tippit, Calspray branch manager, who supervises Pine Bluff operations, there has been a steadily mounting demand for these seed treatment formulations which have widespread application in the area—for cotton seed, rice, soybeans, vegetable seeds and seeds of certain other field crops.

Tippit reports the new plant has been welcomed by growers in the important cotton area, where ample and immediately available pesticides "can be expected to pare down crop losses very considerably." ♦



Front: Bruce D. Cloaninger, Henry A. Davis, R. W. Ludwick, Parks A. Yeats. Back: F. W. Quackenbush, J. D. Patterson, J. C. Allen and M. P. Etheredge.

**'Fly-by-nights'
are discussed as**

Fertilizer Control Officials Air Problems

THE problems of a fertilizer control official never seem to end. Just when he thinks he has a solution to some vexing headache connected with state regulation of fertilizers along comes a new material, a new trend in farm chemicals or a new "fly-by-night" company to complicate matters.

In order to discuss their problems, and seek some practical solution to them, 67 control officials from the United States and Canada got together last month in the Shoreham Hotel, Washington, D. C., for their annual meeting.

K. D. Jacob, USDA; B. Tucker, Coke-Oven Amm. Res. Bur.; W. R. Allstetter, NFA and W. A. Heard, J. Deere.



Members of the fertilizer industry were well represented at the session Oct. 16, with 60 registered. Seventeen government officials and seven members of the trade press brought total attendance at the meeting, one of the largest, to 151.

Besides discussing problems at the regular meeting of the Association of American Fertilizer Control Officials, state officials met with members of the States Relations Committee of the association in an informal session.

The officials didn't concern themselves entirely with

Drs. D. T. Cook, J. D. Campbell and A. M. Smith, of Mathieson Chem. Corp. and J. R. Adams, of USDA.



their problems, however.

They took time out to hear a series of excellent talks by trade association leaders, industry research men and government officials.

Both Paul T. Truitt, president of the American Plant Food Council, and Dr. Russell Coleman, head of the National Fertilizer Association, addressed the group.

The industry men on the program included Dr. Aaron Baxter, agronomist for the Coke Oven Ammonia Research Bureau, Dr. J. B. Hester, soil technologist for Campbell Soup Co., and Dr. Vincent Sauchelli, director of agricultural research for Davison Chemical Corp.

USDA Representatives

Representing the U. S. Department of Agriculture were J. O. Hardesty and R. M. Magness, of the Beltsville station.

Henry A. Davis, New Hampshire, who had served as vice president of the group, was moved up to president in elections that concluded the meeting.

R. W. Ludwig, New Mexico, was named vice president, while work-horse Bruce Cloaninger, South Carolina, was continued as secretary-treasurer.

It was Ernest Epps Jr., Louisiana, who started the discussion about problems of the group.

He mentioned the many new developments in the field, including foliar feeding, soil conditioners and fritted trace elements, and discussed the problems connected with controlling them.

He also blasted spurious advertising used by some mail-order houses to dodge the jurisdiction of the state officials, who have no control over such marketing setups.

Epps said the group had a valuable weapon for fighting misleading advertising.

'Use Counter-Weapons'

"Use your own press releases, explaining the facts about a situation as a counter-weapon to such advertising," he advised.

Another problem facing the officials is concerned with "ragged analysis" of fertilizer ingredients which results from segregation in high analysis plant foods, he added.

President Parks A. Yeats, Oklahoma, opened the convention with a historical survey highlighting the changes in the fertilizer industry since first state regulation of Peruvian guano in Massachusetts in 1856.

He said the fertilizer industry gives every indication of continuing its present expansion, and the control official "must grow along with it."

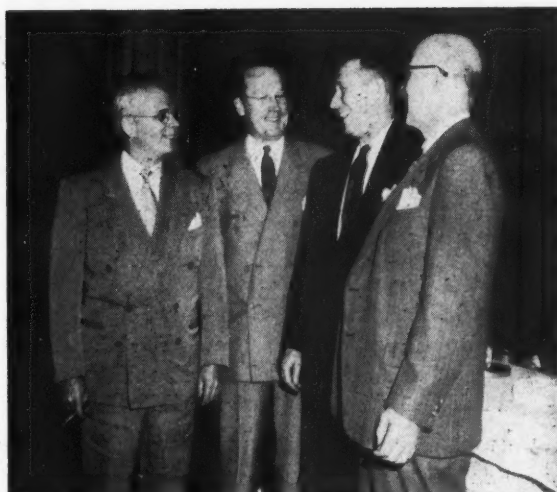
Yeats traced the development of legislation regulating fertilizer mixes and labels. He said the drafting in 1948 of a model fertilizer bill, with which many state laws now conform, was a high point in the AAFCO's history.

Long Range Suggestions

Yeats made these long range suggestions to the officials:

1. Continue to revise state bills in conformity with the model bill and include a section to cover the ever-

NOVEMBER, 1953



J. D. Romaine, Am. Potash Inst.; P. T. Truitt and J. Taylor, APFC; and G. Michael, Montreal, Can.



R. Smith and G. Turner, E. States Farm Coop.; C. Osgood, Me. Ag. Dept., and J. B. Smith, U. of R. I.



S. F. Thornton, F. S. Royster Guano Co.; W. A. Morgan, DuPont, and C. R. Clark, Ga. Dept. of Agric.

Bemis dress print cotton fertilizer bags...

"the extra that pushes a sale ^{your} ~~our~~ way!"

Read this statement from Mr. Hugh Latimer, vice-president of the Supreme Feed & Fertilizer Co., of Philadelphia, Miss. It really tells the whole story... shows why YOU will benefit by packing YOUR fertilizer in Bemis Cotton Bags.

"We have noticed that an attractive Bemis Dress Print Bag can often be the extra that pushes a sale our way.

In most farm families, that piece of goods is a bargain that makes them happy and keeps them friendly."

Hugh Latimer

Hugh Latimer, Vice-President
Supreme Feed & Fertilizer Company



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high analysis
pelletized fertilizers:

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12-24-12 13-13-13

also regular grades
mixed fertilizer

anhydrous ammonia
superphosphate
ammonium sulphate
nitrate of soda
base goods

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Little Rock, Arkansas
Phoenix, Arizona
St. Louis 2, Missouri
Williamston, North Carolina



For complete information write:

MATHIESON CHEMICAL CORPORATION

Mathieson Agricultural Chemicals Division

Little Rock, Arkansas



Parks A. Yeats, retiring president of AAFCO, delivers annual address at Friday morning session.



Henry A. Davis, of New Hampshire, who was elected president, greets members of the association.

"Evaluation of Secondary Elements" was discussed by Dr. Aaron Baxter at the AAFCO meeting Friday.



present menace of exorbitant advertising claims.

2. Publish fertilizer tonnage data semi-annually.
3. Collaborate with other agencies to promote fertilizer usage.

Both trade association heads had high praise for the work being done by the control group.

Truitt joined Yeats in calling for semi-annual fertilizer statistics and told the men they should be prepared for a big job in the spring when fertilizer usage is expected to spurt.

"Farm climate," Truitt predicted, "will improve in the next few months."

He said that the American Plant Food Council and other groups were interested in seeing that no federal legislation encroached on the control officials.

He also discussed the need for crop diversification to balance the problem of farm surpluses and said the country "needs better foreign trade policies to counteract the drop in value this year of 31 per cent."

Coleman Addresses Group

The NFA president took a look at historical data and reported that "through prosperity, depression and

In session at the Shoreham Oct. 12-14 was the Association of Official Agricultural Chemists, which formulates technical definitions and procedures for fertilizer and pesticide officials. New officers elected by the AOAC include Dr. E. L. Griffin, Insecticide Division, USDA, president; Dr. William F. Reindollar, State Department of Health, Maryland, vice president and Dr. William F. Horwitz, of the Food and Drug Administration, secretary-treasurer.

war plant nutrient consumption has increased."

Coleman showed slides to prove his point and declared that farmers can compete in a declining market by using optimum amounts of fertilizer.

He estimated a five per cent increase in fertilizer consumption for the fiscal year ended June 30, and a 10 per cent increase in nutrients.

Dr. Baxter, in discussing evaluation of minor elements, said that along with higher analysis mixes comes the problem of a declining proportion of sulfur, magnesium, calcium and other secondary elements. "These," he said, "must be supplied to the farmer in some form."

The agronomist stressed the value of the elements to crops and soils and declared that "some so-called minor elements aren't minor."

Outlining recent history of foliar application of plant nutrients, Dr. Hester reported that research has shown some effect on the control of plant diseases along with stimulation of growth with use of the foliar sprays.

"The field of foliar applications is not new, having been recorded in Hawaii in 1916," Hester said, adding that "information is limited and the field is a fertile one for extensive research."

'Everything in Sight'

The soil technologist criticized the practice of some farmers of dumping "everything in sight" into the spray tank, sometimes including such pesticides as

(Continued on page 70)



Ernest Epps talks with Floyd Roberts following AEPCO's election of officers. Roberts was elected president and Epps became vice president.

Battelle head tells control men of boom . . .

For the Pesticide Industry: *Dramatic Expansion*

By Hamilton C. Carson
Managing Editor

A DRAMATIC expansion in the pesticide industry during the next few years was predicted by a leader in pesticide research last month.

K. Starr Chester, supervisor of Battelle Memorial Institute, expressed that view before the seventh annual convention of the Association of Economic Poisons Control Officials at the Shoreham Hotel, Washington, D. C. Oct. 17.

"In order to cope with the problem of resistance in insects we are going to require enough entirely different insecticides to permit a

rotation cycle of insecticides," he declared.

Other Talks

Chester's talk was one of three heard by the control officials, who represented the United States and Canada.

The group also heard a talk on legislation and regulation by Dr. Charles L. Smith, of Ethyl Corp., a member of the legislative committee of the National Agricultural Chemicals Association, and a discussion of the National Better Business Bureau in relation to the pesticide field by Van Miller, vice president of the Bureau.

In his talk, Chester first traced

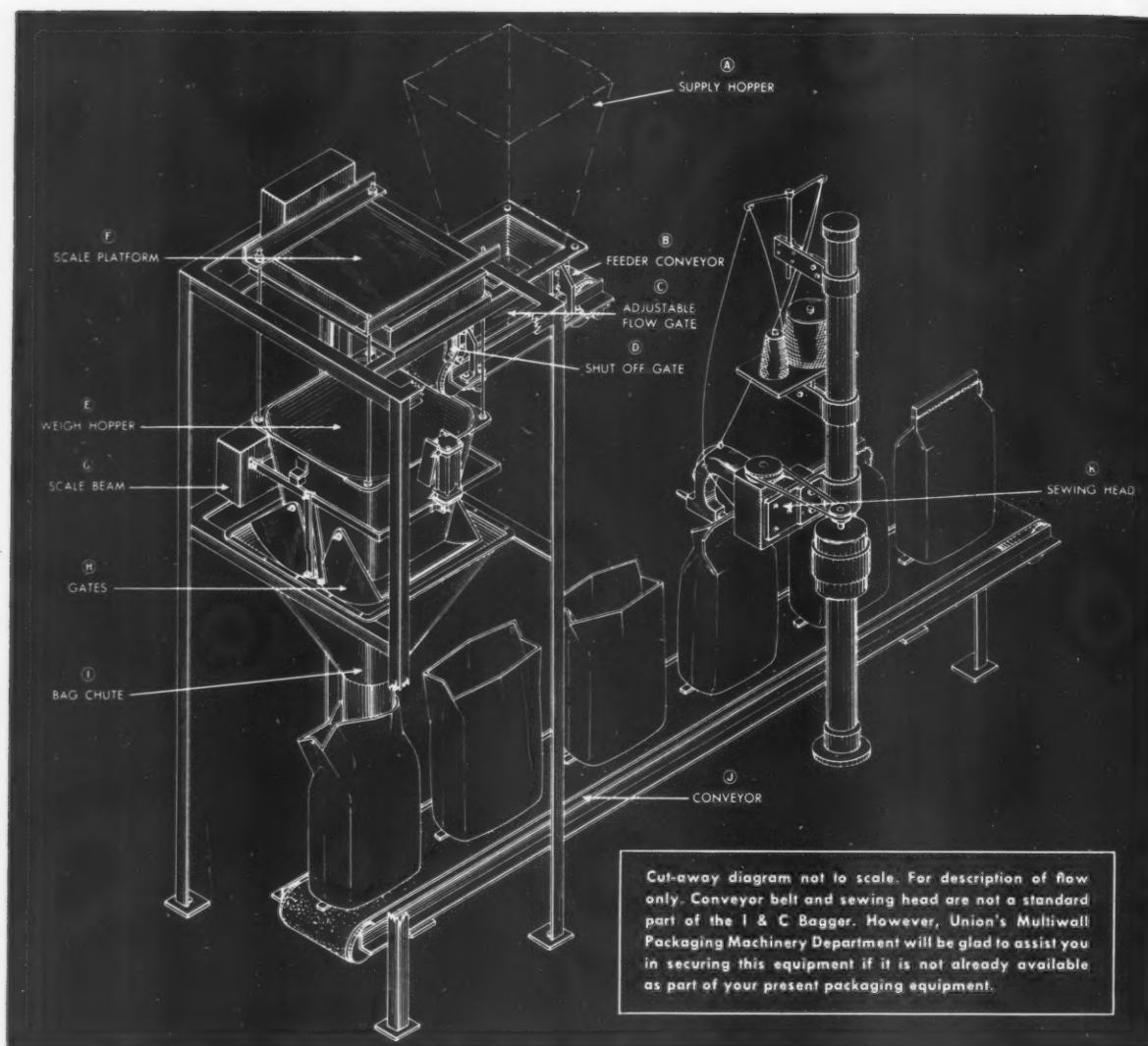
the 12-fold expansion of the pesticide industry in the past two decades and foresaw even greater expansion in the future.

"We can't breed resistant plants fast enough," he stated, "so we need chemicals to protect them."

Chester said he believed "we will see the day when conventional fungicides are regularly applied" to vast acreages of chemically unprotected cropland that represent potential markets for farm chemicals. He cited 85 million acres of land occupied by legumes such as alfalfa, clovers and soybeans.

"A bottleneck in the development of such new markets for pesticides is our comparative ignorance

NOW! UNION BAG OFFERS



OPERATION IS SIMPLE AND PRACTICALLY FOOL-PROOF

MATERIAL to be packaged flows from supply hopper (A) to feeder conveyor (B) which carries material to weigh hopper (E). Adjustable flow gate [located at (C) but not shown] regulates amount of material which feeder conveyor carries. This controls speed of filling cycle.

Weigh hopper (E) is suspended from scale platform (F). When material fed into

weigh hopper reaches weight set on scale, the scale platform actuates scale beam located in box (G).

Scale beam sets off a system of synchronized switches which stop the feeder conveyor (B), lower a shut off gate [located at (D) but not shown] on the weigh hopper end of the feeder conveyor. This prevents any excess material from dribbling into weigh hopper, insuring accurate weight. Switch also opens gates (H) at bottom of weigh hopper. Pre-weighed material drops through filling spout (I) into bag.

With weight removed from scale, scale beam (G) now actuates synchronized switches in reverse order. Simultaneously gates (H) to weigh hopper (E) close . . . shut off gate (D) raises . . . and feeder conveyor (B) starts up and begins next filling cycle.

Bag is held on filling spout (I) by hand. As material drops quickly through spout into bag, filled bag drops onto a moving conveyor belt (J). This belt carries bag through sewing head (K) to complete packaging cycle.

I & C Bagger

Automatic Weighing and Filling Machine for Open Mouth Bags

FASTEST AUTOMATIC BAGGER

**MUCH-DISCUSSED I & C BAGGER WEIGHS AND PACKS
FREE-FLOWING, NON-BRIDGING MATERIALS AT
SPEEDS UP TO 20 100-LB. MULTIWALLS A MINUTE!**

DOLLAR FOR DOLLAR, the new Inglett & Corley Bagger, sold exclusively by Union Bag, is the most efficient and practical unit for accurate, high speed weighing and packing of free-flowing, non-bridging materials.

The I & C Bagger processes 400 to 500 tons in an eight hour day. Its filling and weighing cycle is completely automatic. Weight tolerance is close: in continuous runs, the machine can and does pack to within 4 ounces per 100 lb. bag.

LOWEST COST AUTOMATIC OPEN MOUTH BAGGER

Total cost of the I & C Bagger, with conveyor and sewing head, is more than 25 per cent below any comparable unit, and the I & C has a packing rate 25 per cent greater than any other open mouth packer.

WORKS WELL WITH ALL SIZES OF OPEN MOUTH BAGS

Changeover from one weight to another takes only the few minutes needed to change the scale beam balance. The I & C Bagger handles any open mouth bag, paper or textile, from 10 through 200 lb. weights.

NEEDS ONLY TWO OPERATORS

The I & C Bagger pre-weighs and packs with only one operator plus another man on the sewing equipment. Unskilled labor can be used; men require a minimum of training and supervision.

INSTALLED AND OPERATING IN TWO DAYS OR LESS!

Only 5' x 5' floor space, 8' headroom over conveyor needed. Factory trained personnel will make installation, if desired, at actual cost.

DELIVERY PRIORITIES BASED ON RECEIPT OF ORDER

For quickest possible delivery, consult a Union Packaging Specialist now. Union can also advise you on plant layout and on whatever supplementary packaging machinery you may require.

Manufactured by
INGLETT & CORLEY, INC., AUGUSTA, GA.
Exclusive sales agents:

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HIGHER PRODUCTION ... LOWER COSTS ... LESS DOWN TIME ...

Ask to see the impressive performance records the new I & C Bagger already has established in daily field use. Production jumps. Labor costs drop sharply. Down time is slashed.

Make your own comparison with any other packer. Verify for yourself that Union's I & C Bagger is more economical initially—cheaper to install—less expensive to maintain.



**MULTIWALL
PACKAGING
MACHINERY
DEPARTMENT**

of the amounts of losses caused by various pests in various crops and types of livestock," he added.

Worse than Fire

Chester said insects and diseases cause 35 per cent more destruction to our forests than fire, yet we are spending \$30 million a year for forest fire control and "only a pittance" for the control of forest pests.

In foreseeing the possibility of entirely new types of pesticides in the future, Chester saw these needs:

1. A method of stimulating crops to more efficient use of energy and nutrients. "Growing plants are inefficient," he stated, "they make use of less than one per cent of the sun's energy that falls on them."

2. New chemical growth regulators (like malaic hydrazide and CDAA but with more specific effects) are good probabilities. These are needed for the homeowner to keep shrubbery down to an attractive size as well as for the farmer to delay budding and sprouting.

3. A way of altering the growth habits of plants so that legumes could be grown that would mature their fruits at once.

4. Systemic fungicides, bacteri-

cides and virucides to add to the present systemic insecticides.

5. Manipulation of microbial actions in the soil to benefit the crop.

Some of the major problems facing members of the pesticide industry, Chester summarized, are these:

1. The tremendous cost of introducing a new pesticide to the market. The speaker estimated that it costs a half-million dollars, including the cost of the failures along with the success.

2. Cost of evaluating a chemical for pesticidal activity. Chester said basic research can reduce the figure. He added that "perhaps the principle of sharing costs can be brought in." He urged two or three chemical producers to combine in doing research or development jobs that none could afford alone.

3. The difficulty of eliminating residue hazards involved with systemics, which can't be washed off.

Less Optimism

Dr. Smith took a less optimistic view of the years ahead in the pesticide industry.

While conceding that great expansion undoubtedly would take place, he visualized a reduction in

the number of pesticides introduced in the near future, because of the present poor profits in the field.

"There probably will be a lull after the initial boom, with production picking up a little later on," he advised.

Dr. Smith said that because of the rapid growth of the field "we lack a coordinated overall policy. Adequate legislation," he said, "hasn't yet caught up with the field."

He described three basic attitudes toward pesticides:

1. Prove beyond the shadow of a doubt that pesticides are not toxic to humans before using them.

2. Let any pesticide be marketed and let the buyer beware.

3. The middle-of-the-road attitude that says we can use dangerous pesticides if they are handled properly.

Dr. Smith said the industry is faced with a public relations job to show consumers the value and safety—if properly used—of pesticides. He reiterated Chester's estimate of the cost of introducing a pesticide as a deterrent to most manufacturers.

He called on the control officials to help industry in finding a solution to the long delays encountered by many companies in seeking registration for their products.

Van Miller, the Better Business Bureau representative, described the workings of the organization and explained its activities in the pesticide field.

No Legal Powers

While stressing the fact that the BBB has no legal powers, he said its ability to influence public opinion of a company or its products was its chief weapon.

He said the Bureau wants to cooperate with industry members in fighting irresponsible advertising that vitiates the good work being done by a majority of manufacturers in the field.

He said he worked with industry members in preparing recent bulletins on soil conditioners and liquid fertilizers.

Miller said the Bureau frequently is called on by advertising agencies to check the content of advertising before it is published.

He said the pesticide field is wide open to irresponsible advertising

K. Starr Chester speaking to the control officials on "Looking Forward in Pesticide Research and Control" at AEPCO's Saturday morning session.



because of the generally conservative tenor of industry advertising makes it stand out by contrast.

Miller divided advertisers into three basic groups:

1. Established firms who keep strictly to the facts in their advertising.

2. "Fly-by-nights" who use a hit and run advertising attack. Miller said such concerns are not a major problem because they don't fool many people and their impact is light.

3. Mail order promoters who sell one product after another and who are dangerous because they are legitimate, they use an "amazing amount" of money for advertising and because they can do irreparable harm to a chemical field.

Some Authority

"Scientific disputes in any field are enough so you can find some authority for almost any idea," he said. Miller asked for the help of control officials and industry members in reporting bad advertising practices to the Bureau.

Rodney C. Berry, Virginia, outgoing president of the AEPCO, addressed the group briefly, mentioning the continuing problems connected with fertilizer-pesticide mixtures and companies that are "working the garden trade," exploiting the field in many states.

Other problems which the control officials face in their everyday duties were aired in the meeting of the States Relations Committee on Friday evening, Oct. 16.

Before adjourning, the group voted tentatively to change the name of the organization to the "Association of Pesticide Control Officials, Inc."

The change, recommended in an executive committee report given by Floyd Roberts, North Dakota, would become official if approved at next year's meeting.

Three associations held open house in a Shoreham suite for the officials. The associations included the National Agricultural Chemicals Association, Chemical Specialties Manufacturers Association and the Manufacturing Chemists' Association.

Roberts was elected to head the organization for the coming year, being moved up from vice president. E. A. Epps Jr. was named

NOVEMBER, 1953



Dr. Charles Smith, associate director of product development, Ethyl Corp. speaking to convention. R. C. Berry and A. B. Heagy are seated.



"The Role of the National Better Business Bureau in the Advertising of Pesticides" is explained by Van Miller, the bureau's vice president.

to the post of vice president and Albert B. Heagy was continued as secretary-treasurer of the group.

Many of the pesticide control officials also are responsible for fertilizer control in their states, so

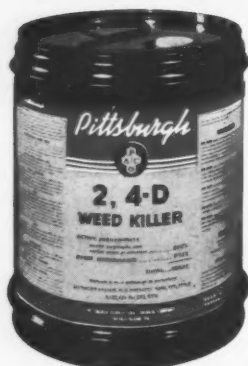
there was a big duplication of membership for the control meetings.

AEPCO met in closed session Saturday afternoon to discuss special problems and exchange views on their work. ♦

Your customers
could control weeds
like this ...



but for fast, positive control, sell them



Pittsburgh

2,4-D

You can increase your sales and profits and build up a greater list of satisfied customers by recommending *Pittsburgh* 2,4-D. This powerful chemical weed killer is economical and easy to use, and, in the low volatile ester formulation—*Pittsburgh* D4—the chances of damage to nearby crops is reduced to a minimum. *Pittsburgh* 2,4-D provides more uniform and dependable weed killing results because it's *Quality-Controlled* at every step of production—from coal to finished chemical. That's your best possible assurance of consistent peak quality and continuing, dependable supplies. Sales and technical information is yours for the asking.

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Standard for Quality

ORGANIC INSECTICIDES: Benzene Hexachloride, Toxaphene, Dichloro Diphenyl Trichloroethane, Aldrin, Dieldrin, Chlordane.

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WEED KILLERS: 2,4-D Acid, 2,4-D Amine Concentrates, 2,4-D Ester Formulated Concentrates, 2,4-D Sodium Salt Monohydrate, D4 (Low Volatile 2,4-D Ester), 2,4,5-T Formulations.

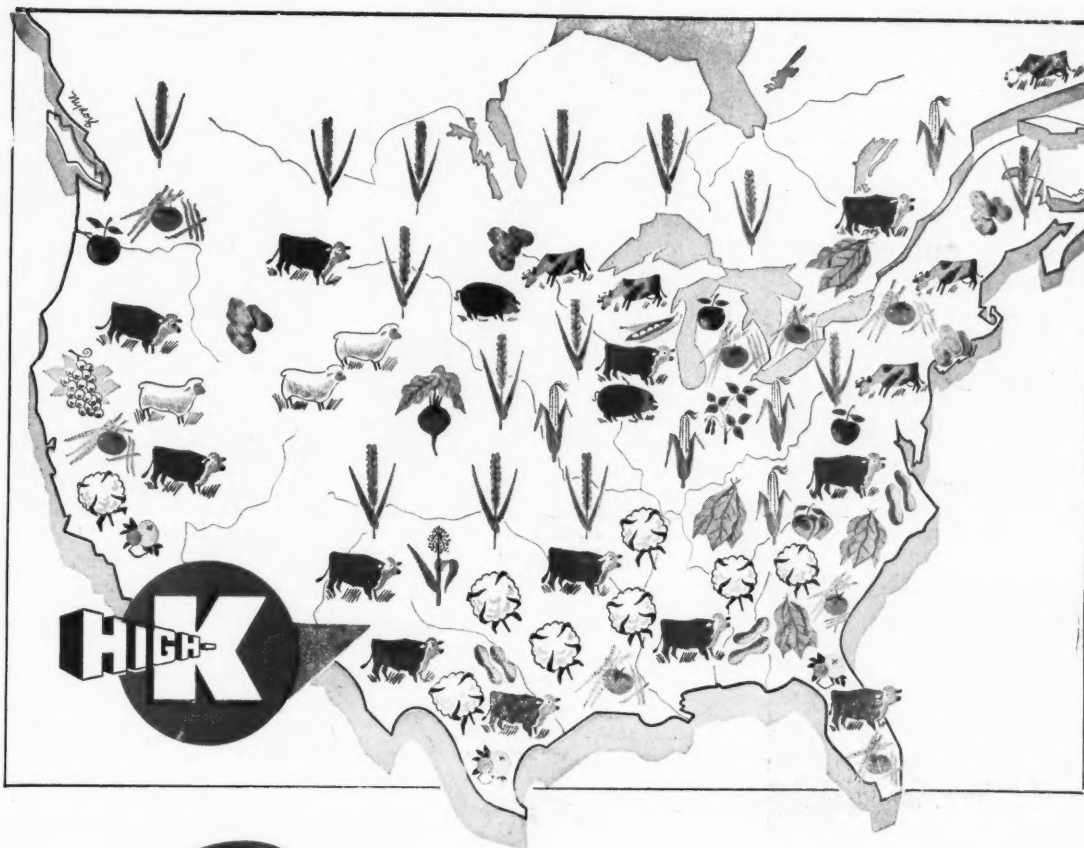
FUNGICIDES, SEED DISINFECTANTS, COTTON SPRAYS AND DUSTS, AND OTHER SPECIAL AGRICULTURAL CHEMICALS.



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C. M. Ferguson



Louis Ware



J. Roger Deas



Dr. Russell Coleman

Sen. Richard Russell



27th fall convention

NFA Meeting In Atlanta Nov. 16-18

EVERY aspect of increasing fertilizer usage—from broadening the market to utilizing the help of county agents and latest sales techniques—will be discussed at the 27th annual southern convention of the National Fertilizer Association in Atlanta Nov. 16-18.

Overall theme of the fall convention, to be held in the Atlanta Biltmore Hotel, will be how to encourage more widespread adoption of recommended fertilization practices. The NFA and companies in the industry are agreed that using fertilizers is one of the most effective means by which the farmer can reduce production costs per unit of farm output, thereby helping to maintain profits in the coming period of crop adjustment.

Educating Farmers

But getting farmers to believe that is another problem; a problem that will be dealt with extensively by NFA officers and guest speakers, according to association president Dr. Russell Coleman.

Highlighting the two-day general meeting is scheduled to be the address by Sen. Richard Russell

FARM CHEMICALS

(D.-Ga.), who will talk on "What's Ahead for the American Farmer."

Other guest speakers include Raymond Rosson, C. M. Ferguson and J. Roger Deas.

In addition to the guests, NFA members attending the sessions will hear addresses by Louis Ware, president of International Minerals & Chemical Corp. and chairman of the NFA board of directors, and W. R. Allstetter, vice president of the association.

Rosson, county agent of Jonesboro, Tenn., has the topic "Fertilizer . . . A Cornerstone for Community Development."

Rosson's county—Washington—has undergone a thorough face-lifting during the past few years by the adoption of sound farming practices. He is expected to emphasize the key role of fertilizer in the economic and social development of the community.

Extension Director

Ferguson is widely known as the director of the USDA Extension Service. His talk, on "Putting Agricultural Research to Work," is expected to call attention to the problem of making more timely and practical application on the farm of the results of agricultural research.

He probably will suggest methods by which members of the fertilizer industry can help solve the problem. Before his appointment to Extension, Ferguson was director of the Ohio Agricultural Extension Service and was chairman of the Extension Committee on Organization and Policy of the American Association of Land Grant Colleges and Universities.

He makes his home near Columbus, O., and has been active in agriculture for more than 30 years.

How To Sell

The importance of imagination and initiative to a sound marketing program will be stressed by Deas, who is Atlantic division representative for the American Can Co. Title of his talk is "Selling—The American Way."

Allstetter will keynote the conference with a talk on "Broadening the Base of the Fertilizer Market."

Ware, who will speak briefly to open the first session will preside at both meetings. ♦

NOVEMBER, 1953

National Fertilizer Association Annual Fall Convention

Atlanta Biltmore Hotel, Atlanta, Ga.

Nov. 16-18, 1953

PROGRAM

SUNDAY

7 p.m. Executive Committee Meeting

MONDAY

10 a.m. Board of Directors' Meeting

TUESDAY

10 a.m. General Meeting

LOUIS WARE, president, International Minerals & Chemicals Corporation and chairman, board of directors, The National Fertilizer Association, presiding.

"Broadening the Base of the Fertilizer Market"—

W. R. ALLSTETTER, vice president, The National Fertilizer Association.

"Fertilizer . . . A Cornerstone for Community Development"—

RAYMOND ROSSON, County Agent, Jonesboro, Tennessee.

"Putting Agricultural Research to Work"—

C. M. FERGUSON, Director of Extension Service, United States Department of Agriculture.

6:30 p.m. Cocktail Party—Compliments of Ashcraft-Wilkinson Company.

7:30 p.m. Annual Fall Banquet—Empire Room—Mr. Ware, Toastmaster.

9 p.m. Entertainment and Dancing.

WEDNESDAY

8:30 a.m. Meeting—Committee on Publications

10 a.m. General Meeting

Chairman **L. Ware** presiding.

"Selling—The American Way"—

J. ROGER DEAS, Atlantic Division representative, American Can Company.

"What's Ahead for the American Farmer"—

Sen. RICHARD RUSSELL (D.-Ga.)

Business Meeting.

12 Noon Adjournment.

Sulphur

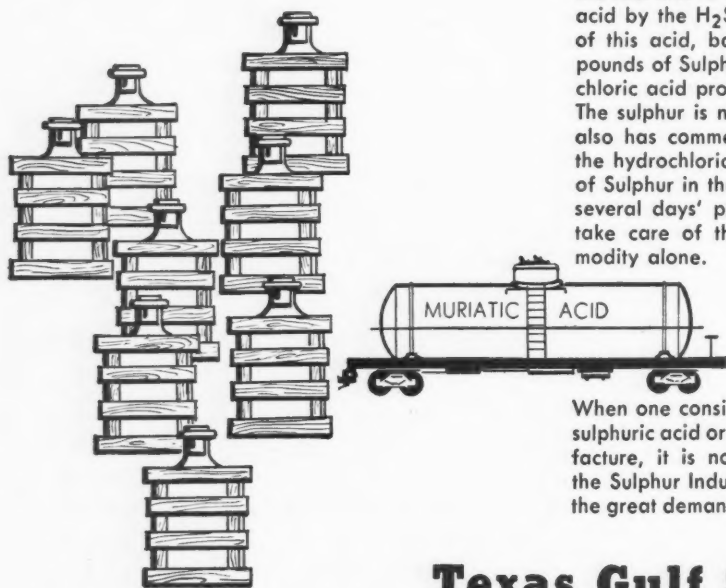
*Thousands of tons
mined daily,
but where does it all go?*



Loading a ship with Sulphur at Galveston

PARAPHRASING an old saying: 'It takes a chemical to make a chemical,' certainly applies to hydrochloric acid.

No chemical engineer has to be told how hydrochloric acid is made but sometimes with the mind focussed on the word "hydrochloric" little thought is given to another word "sulphuric." It is this word that calls attention to the fact that to make one net ton of 20° Bé hydrochloric acid by the H_2SO_4 process requires about 950 pounds of this acid, basis 100%, which is equivalent to 320 pounds of Sulphur. About one third of the annual hydrochloric acid production is made by the use of sulphuric. The sulphur is not lost because salt cake, a by-product, also has commercial value. But any way you figure it, the hydrochloric acid industry is an important consumer of Sulphur in the form of sulphuric acid. In fact, it takes several days' production from all the Sulphur mines to take care of the annual production of this one commodity alone.



When one considers all the other chemicals that require sulphuric acid or other Sulphur compounds for their manufacture, it is not difficult to appreciate how faithfully the Sulphur Industry is serving industry today in spite of the great demands made upon it.

Texas Gulf Sulphur Co.

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Mines: Newgulf and Moss Bluff, Texas

FARM CHEMICALS

*For formulating
pesticides . . .*



Recommendations for 96 formulation problems are offered by the new Atlas HLB Surfactant Selector, the pocket-size dial-type selector shown above.

Atlas Selector For Surfactants

ATLAS POWDER CO. has developed a handy cardboard indicator that should take a lot of the work out of finding the correct surfactant for pesticide emulsion formulas.

In building new emulsion formulas, many companies perform extensive laboratory research on surfactants. Atlas researchers, with the new instrument, have turned their work into time-saving benefits readily available to pesticide manufacturers.

The instrument, a pocket-size dial-type selector, offers emulsion formulators a precise surfactant recommendation for 95 different and specific formulation problems, condensed from all recent Atlas "formulary" literature.

Printed on durable card stock, the device measures 10 $\frac{5}{8}$ by 6 $\frac{3}{4}$ inches and is accompanied by full directions. The formulas chosen from Atlas literature for use on the new dial device are typical basic formulas. Therefore surfactant recommendations indicated by the device may be used as a guide in solving numerous other problems.

Based on Atlas HLB System

The new device is based on the Atlas HLB (hydrophile-lipophile balance) system. In this system, each Atlas surfactant has been assigned an empirical number representing its HLB, i.e., its attraction for oil or water. Furthermore, the common applications of surfactants have also been assigned HLB numbers—for example, it has been found that all surfactants which are acceptable as detergents (in water) have an HLB value of 13 to 15, W/O emulsifiers have an HLB range of 3-5, etc.

Eighteen agricultural applications specifically covered by the selector are the following insecticides:

Toxaphene, chlordane, aldrin (two formula-

tions), DDT, DDT/toxaphene, parathion, BHC or BHC/DDT, lindane and dieldrin.

In addition, the selector covers the following:

Miscible oil spray, oil emulsion spray, insect repellent, 2, 4-D herbicides (isopropyl), CIPC herbicides, 2, 4, 5-T herbicides, herbicide weed oils and anti-dust agents.

Other surfactant applications covered on the twin dials include: detergents (formulation of cleaning compounds), cosmetics, pharmaceuticals, textile and industrial (oil and wax emulsions, polishes, lubricants, etc.).

A Typical Example

Here's how the selector and the system would work for a farm chemist who wanted to formulate an aldrin insecticide. By turning the dial on the front to this application, he can read off that:

1. non-ionic O/W emulsifiers are recommended—specifically Atlox 1256,
2. an HLB of approximately 10 is ideal for this application,
3. a surfactant concentration of approximately five per cent is required and
4. the key ingredient is xylene.

One Emulsifier Indicated

For most applications, as in this case, the device indicates one specific emulsifier. When a blend is recommended, the user can turn to the reverse side of the selector and calculate the percentage of each surfactant in the blend by means of a specially designed spiral calculating device.

To obtain an HLB Surfactant Selector, fill out a Reader Service card, using Code Number 11-1. ♦



Industry members assembled in TVA's Chemical Engineering Building prior to discussion on the Authority's Continuous Ammoniator.

Improved products,
lowered costs seen
with new equipment

Fertilizer Men Tour TVA Ammoniator

A CROWD of more than 300 fertilizer industry representatives last month got a Cook's tour of one of TVA's latest projects of interest to the industry.

L. D. Yates, of the Tennessee Valley Authority, described the continuous ammoniator developed by the Authority, then conducted a tour of the pilot plant, and a demonstration of its use.

J. H. Walthall, director of TVA's Division of Chemical Development, welcomed industry representatives.

Yates told the representatives they had been invited to Muscle Shoals, Ala., to see the ammoniator in action "because we believe that you may be able to use this piece of equipment to advantage in the production of fertilizer in your plants."

He said the Authority believed that through using the ammoniator, fertilizer industry members might be able to improve their products and/or reduce production costs.

Do you want to use the TVA continuous ammoniator in the production of fertilizer at your plant? TVA official L. D. Yates told industry members at the demonstration that anyone who so wishes may obtain a royalty-free non-exclusive license to do so.

He said a license granted on an application amounts to an understanding that a license will be granted under the same conditions when and if a patent is issued to TVA.

He said objectives of TVA included the major one of improving and cheapening production of fertilizer.

"Responsibility for achieving that objective," he added, "has been delegated to the Office of

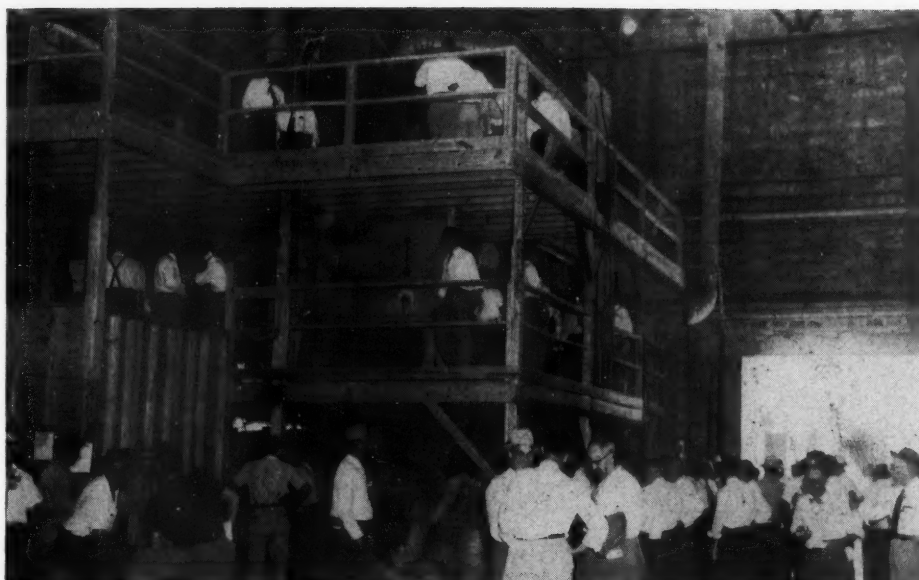
Chemical Engineering at Wilson Dam, and to discharge it, a broad research and development program on processes and techniques of fertilizer production has been set up here."

In describing the TVA ammoniator at the tour, Yates told the industry representatives:

Our investigations may be carried out on many different scales. They may start in the laboratory in the test tube, and may be carried from there through the pilot plant and may be completed in a demonstration-scale plant that approaches commercial size. The projects we undertake are of two types.

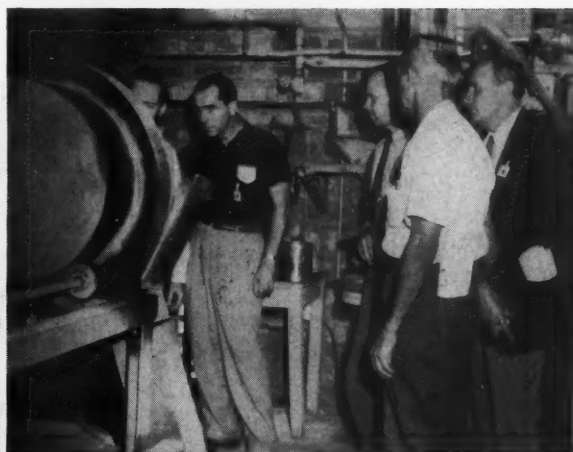
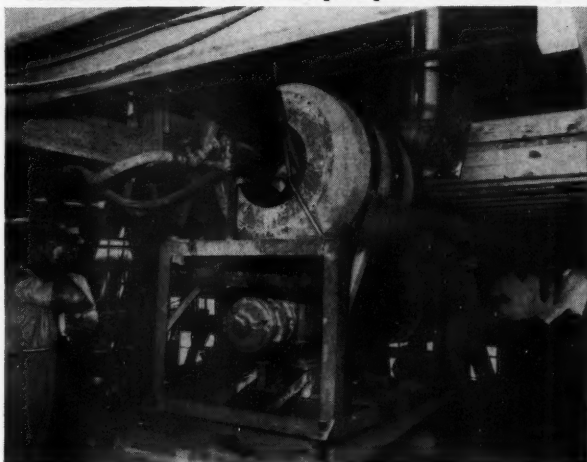
First are those that are aimed at the development of entire processes that are different from those in use by the fertilizer industry in this country today. Our example is our calcium metaphosphate process that we have developed through the demonstration scale, and that

FARM CHEMICALS



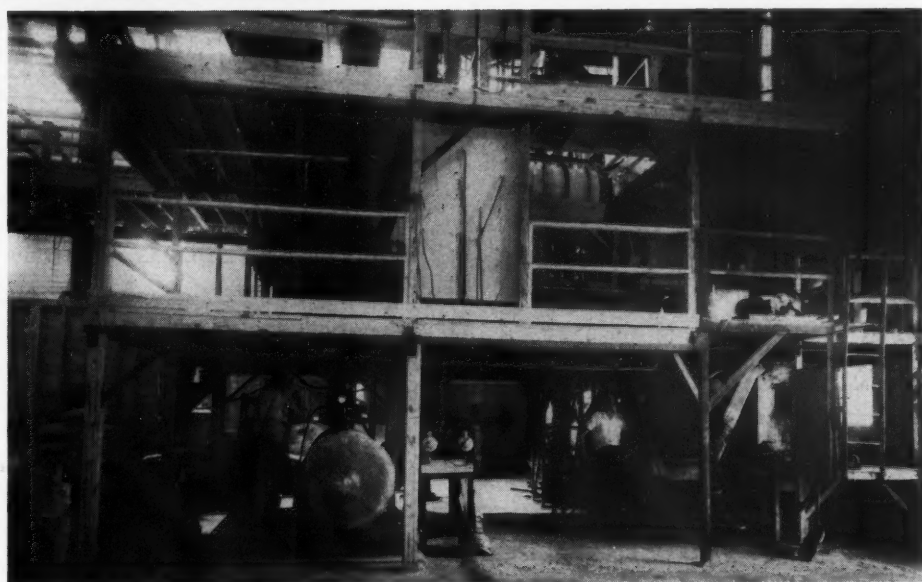
Here are some of the 300 visitors who toured the Authority's pilot plant on Sept. 15.

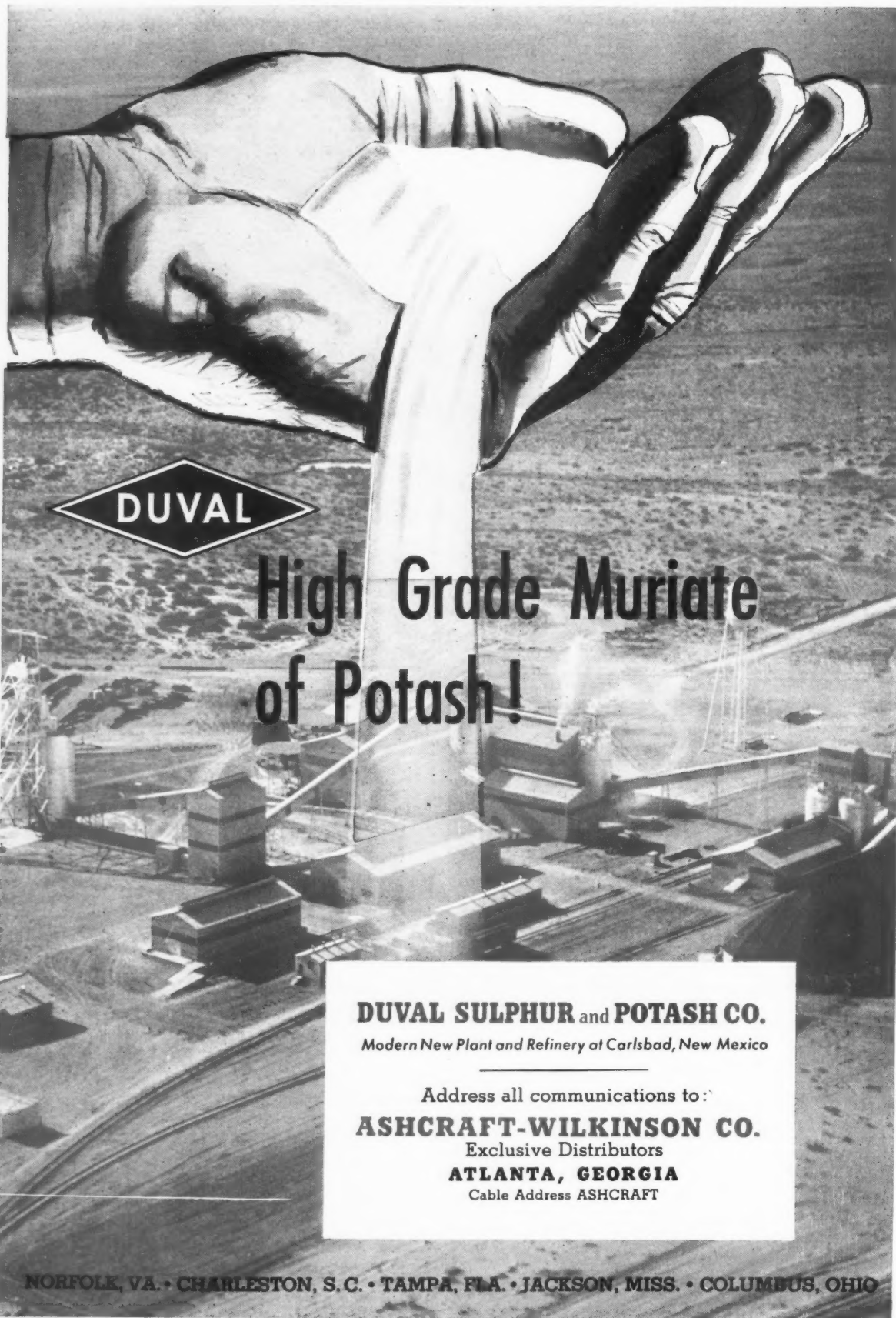
Photograph shown below illustrates the feed end of the continuous ammoniator in the pilot plant at Wilson Dam.



Fertilizer industry representatives examine the discharge end of Tennessee Valley Authority's granulator.

At right is a south view of the continuous ammoniation pilot plant, taken during the tour.





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we believe will find considerable use as a means of exploiting the western phosphate deposits. Other examples are the nitric phosphate processes, some of which will be in use as soon as plants now under construction are completed.

NFA Is Helpful

The second type of projects includes those that are aimed at improving parts of existing fertilizer processes or of developing processes that might be fitted into existing fertilizer plants. On projects of this type, liaison with the fertilizer industry through the National Fertilizer Association is proving very helpful.

Our work on ammoniation falls within that category. We carried out our work on ammoniation in pilot-plant equipment. Our first objective was to define means of ammoniating superphosphate or mixtures to a higher degree than usual without serious reversion of P_2O_5 , loss of ammonia or other undesirable effects. Increasing the degree of ammoniation would be advantageous because ammonia and ammoniating solutions are the cheapest forms of nitrogen available to the fertilizer manufacturer.

Another objective of the experimental work was to devise improved equipment for carrying out ammoniation. We spent a large proportion of our time on the development of a continuous ammoniator because we believe that a continuous ammoniator inherently is superior to a batch one in several important respects.

In a continuous machine, ammoniation proceeds all of the time. No time is lost in charging and discharging, and more effective use can be made of the space in the ammoniator. We believe that through the use of a continuous machine, instead of a batch one, many of the errors that inhere in high-speed manual operation can be avoided.

Started With NH_3

We started our work with an investigation of the ammoniation of TVA's triple superphosphate using anhydrous ammonia. The first continuous ammoniator we tried was a screw mixer with interrupted flights, and later a Roto-Louvre drier was tried. Both proved unsatisfactory for our purpose.

Further study resulted in the development of the continuous ammoniator. Using this machine, as much as nine per cent nitrogen from anhydrous ammonia could be incorporated in triple superphosphate without loss of ammonia, whereas incorporation of only six per cent nitrogen in a commercial-size batch ammoniator resulted in the loss of 10 per cent of the ammonia.

A great deal of the development

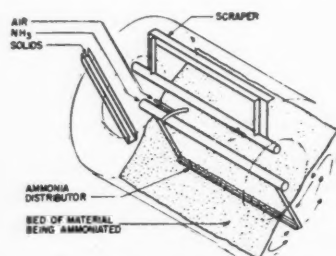


Fig. 1. TVA Ammoniator

work on the continuous ammoniator was done using triple superphosphate and anhydrous ammonia, but studies of the ammoniation of fertilizer mixtures containing ordinary superphosphate with nitrogen solution have been carried out in our new continuous ammoniator also. Some details of the results that have been obtained with mixtures and solutions will be given after the description of the ammoniator itself.

Pilot Plant Model

The pilot plant ammoniator consists of a hollow cylinder three feet in diameter and three feet long, which is rotated by means of a chain connected to a variable-speed drive. Usually, the ammoniator is turned at nine or 10 r.p.m. Means of feeding superphosphate and other solids and of removing ammoniated products are provided. A hood which is connected to an exhaust fan is provided to remove vapors and fumes from the discharge end of the ammoniator.

Figure 1, which is a pictorial view of the internal parts of the ammoniator, shows that there are no flights in the cylinder. The solids in it form a rolling bed, the depth of which is controlled by means of retaining rings at the ends of the cylinder. Tests with mixtures have indicated that a bed

depth one quarter of the diameter of the cylinder is satisfactory. Increasing the bed depth to one third of the diameter resulted in operating difficulties.

The cylinder is pitched one inch per foot, and there is a scraper that consists of a piece of two-inch angle iron that cleans the inside of the cylinder at the top. Ammonia or nitrogen solution is introduced under the rolling bed from a distributor of the slit type.

Air Removes Moisture

As a means of controlling the physical condition of the solids in the ammoniator, air may be blown through it to help remove moisture, that is, if the solids become wet during ammoniation and start to ball up, the extent to which they agglomerate may be controlled by adding the proper amount of air. The feasibility of blowing air through the ammoniator to remove moisture and prevent balling is thought to be one of the important advantages of this ammoniator over ammoniators of the batch type. Only a small amount of air is required to serve this purpose. In our tests, five to eight pounds of air per 100 pounds of ordinary superphosphate have been found to be very effective.

Some mixtures remain dry and powdery during ammoniation, and if it is desired that these materials be agglomerated to form granules, water may be sprayed on the rolling bed within the ammoniator to assist agglomeration.

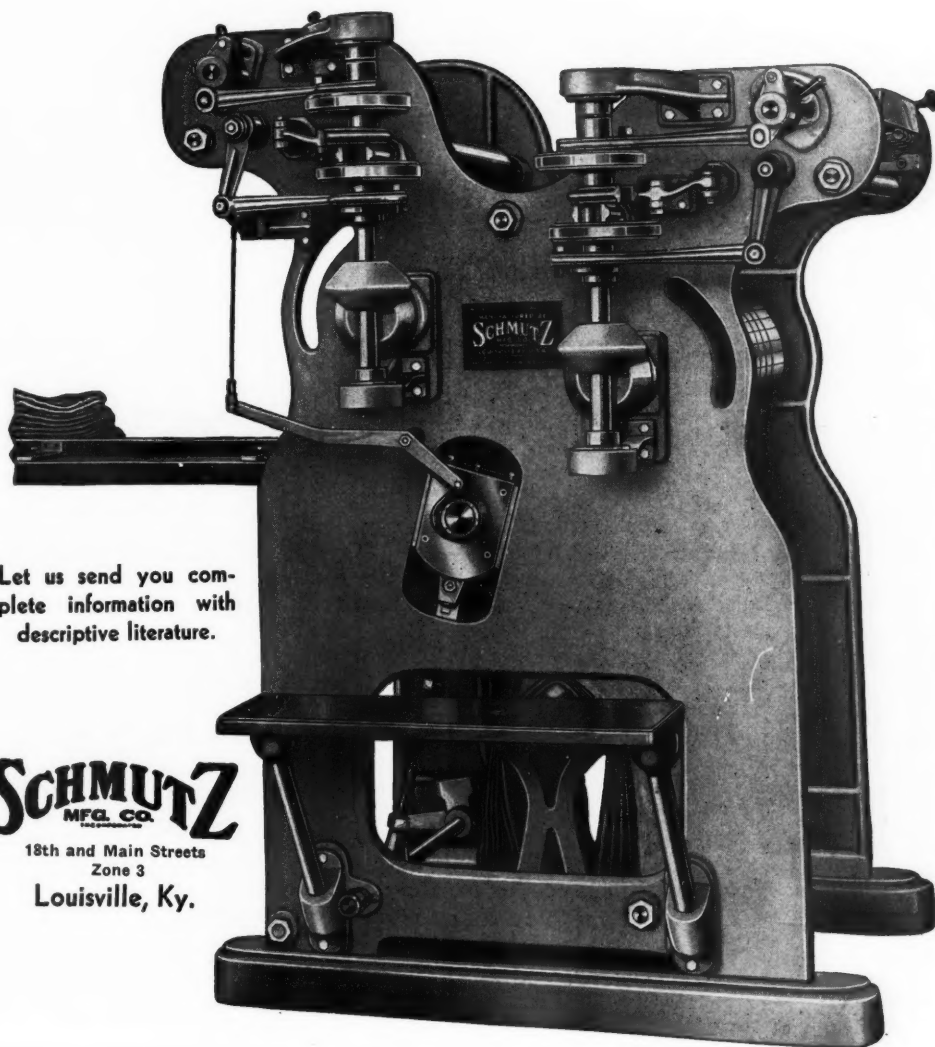
Ammonia Distributor

The ammonia distributor is 33 inches long. There are six holes drilled in the distributor tube. Ammonia or solution enters the supporting pipe and flows to both ends of the distributor. The distributor is a $\frac{1}{2}$ -inch stainless steel tube that has been flattened somewhat for the purpose of streamlining. The ammoniating medium passes through the holes in the flattened tube and enters a V-shaped chamber that has been formed by welding two flat pieces of steel to the tube. This chamber is divided into sections.

Yates went on to give further data on the production technique with the ammoniator and the results obtained. ♦

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Super is taken from storage and loaded in pay-loaders before going to Norfolk mixing plant.

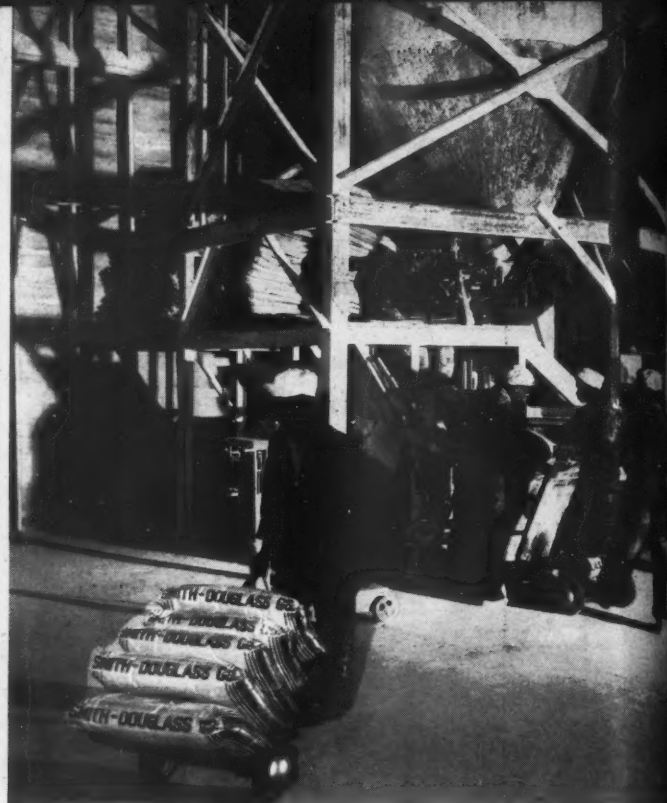


Photo shows Nova Scotia land plaster being bagged in the Norfolk plant of Smith-Douglass Company.

Smith - Douglass Co:

Getting Bigger



Ralph B. Douglass

SMITH-DOUGLASS Co., Inc., with general offices in Norfolk, Va., has been expanding for more than 30 years in the manufacture of mixed fertilizers, but the past year is the highlight in the company's growth.

Since September, 1952, the company has undergone its greatest expansion in more than three decades.

During the last year it has made these major

moves:

1. Acquired, in September, 1952, the Coronet Phosphate Co., which owns extensive reserves of high-grade rock near Plant City, Fla.

2. Made the first public offering of common stock in November, 1952. The 370,000 shares involved in the offering represented 40 per cent of the 924,580 shares then outstanding. Prior to the public offering common stock had been privately held and was not available to outside investors.

Merged with San Jacinto

3. Merged last spring with San Jacinto Chemical Corp., Smith-Douglass emerging as the surviving

corporate body. Already underway is a \$1.6 million expansion program designed to boost production of anhydrous ammonia at San Jacinto from 80 to 120 tons of NH_3 a day.

4. Had its stock accepted for trading on the New York Stock Exchange on June 1, 1953, thus making it more available to the investing public.

Other highlights of the year have included the establishment of a department of research and development and the first retirements because of age under the employee pension plan.

Such growth naturally did not go unnoticed. The Virginia State Chamber of Commerce brought statewide attention recently to the activities of Smith-Douglass in an article by Frank Sullivan in the September issue of *The Commonwealth*, monthly magazine of the Chamber.

Operates 11 Plants

The company deserves nationwide recognition of its advances. Today it controls and directs the operation of 11 plants in eastern and midwestern states, the Coronet Phosphate Co. mine of 12,500 acres, a nitrogen-fixation plant, three nitrogenous tankage plants, two large integrated fertilizer manufacturing plants and four fertilizer mixing plants.

The widespread organization employs about 1,425 persons in all its operations.

Much credit for the rapid and efficient growth of

FARM CHEMICALS



Ralph B. Douglass, president, discusses recent expansion with Z. H. Zwemer, W. B. Copeland, D. C. Kieffer, W. Farley Powers, James H. Culpepper, P. T. Smith, S. L. Lott, Mills W. Darden, Willard R. Ashburn, J. V. Champion and J. A. Monroe at one of Smith-Douglass Co.'s regular meetings for those in executive positions.

er All the Time

the company must go to Ralph B. Douglass, who joined the company in 1927 as vice president. Douglass served until 1950 with Oscar F. Smith, then was elevated to head the organization after Smith's death that year.

It was Smith's idea to start the company. General superintendent of a fertilizer plant in Norfolk, he conceived the idea in 1919 of specializing in the manufacture of tankage, which played a bigger part then in supplying nitrogen for crops than it does today.

Smith persuaded Robert B. Rowland Jr. to join him in the tankage venture and the pair set up the nucleus for the company which today manufactures many grades of mixed fertilizers and fertilizer materials.

Although Rowland is no longer associated with the company, the Smith-Rowland Co., a division of the parent organization, still bears his name.

Expansion Every Year

Expansion of the company was necessitated each year by increased production, so Smith bought a 52-acre site on the Southern branch of the Elizabeth River, near Norfolk, where the first units of the present plan were built in 1926.

The following year Douglass bought into the company, was elected vice president and the combined efforts of the two men proceeded to give it a push that sent it upward even through the depression years which followed.

NOVEMBER, 1953

The Norfolk plant was expanded; a new plant was constructed in Danville, Va., in 1929 and another in Kinston, N. C. a year later.

Other plants were added throughout the country in the years that ensued.

The Smith-Rowland division, handling nitrogenous tankage, bought a plant in Granite City, Ill. in the early thirties; the Norfolk plant added sulfuric acid and superphosphate to its production in 1935 and the company built a fertilizer manufacturing plant in Streator, Ill., in 1945.

A superphosphate plant and a sulfuric acid unit were soon added to the Streator operation, giving Smith-Douglass its second integrated operation. Planned for completion next year at that site is a \$500,000 phosphoric acid plant.

Use War-Surplus Hangars

Even when construction materials were almost nonexistent in 1945, the company used several war-surplus airplane hangars in Wilmington, N. C. to house a mixing plant. Another mixing plant was added at Albert Lea, Minn., in line with increased midwestern usage of fertilizer and a third tankage plant was erected in Selbyville, Del. two years ago.

It appears that the expansion program isn't completed yet. The company is watching the trend toward the manufacture of higher analysis mixes, granulated fertilizers and increased industry integration. All these factors will have a big effect on future development of the company.

Serving under Douglass as vice presidents are W. R. Ashburn, general council, W. B. Copeland, J. A. Monroe and J. H. Culpepper. ♦

Ultra-modern Fisons company makes
granular product in one operation

British Use Dorrco Process For Granulated Triple Super

A UNIQUE process, used in a British plant for manufacture of granulated triple superphosphate, was described at a recent meeting of The Fertiliser Society (of England).

The process, for manufacture of the product by using a mixture of sulfuric and phosphoric acids, was developed by the Dorr Company, of Stamford, Conn.

The Dorr method is in operation at the Immingham Triple Superphosphate plant near Grimsby, Lincolnshire, England.

One of the most valuable features of the process, according to J. Frisken and J. J. Porter, of the Immingham factory, is that it produces in one operation an excellent granular product which substantially requires no curing.

Frisken and Porter read a paper

FARM CHEMICALS expresses its thanks to M. I. Whittingham of the Fertiliser Society (England), for permission to print this description of the Immingham plant and for supplying the illustrations; to the authors, J. J. Porter and J. Frisken, and to C. M. Comstock, assistant advertising manager of The Dorr Company, Stamford, Conn.

on the Dorr process, as used at Immingham, at a meeting of The Fertiliser Society earlier this year.

Dorr Process

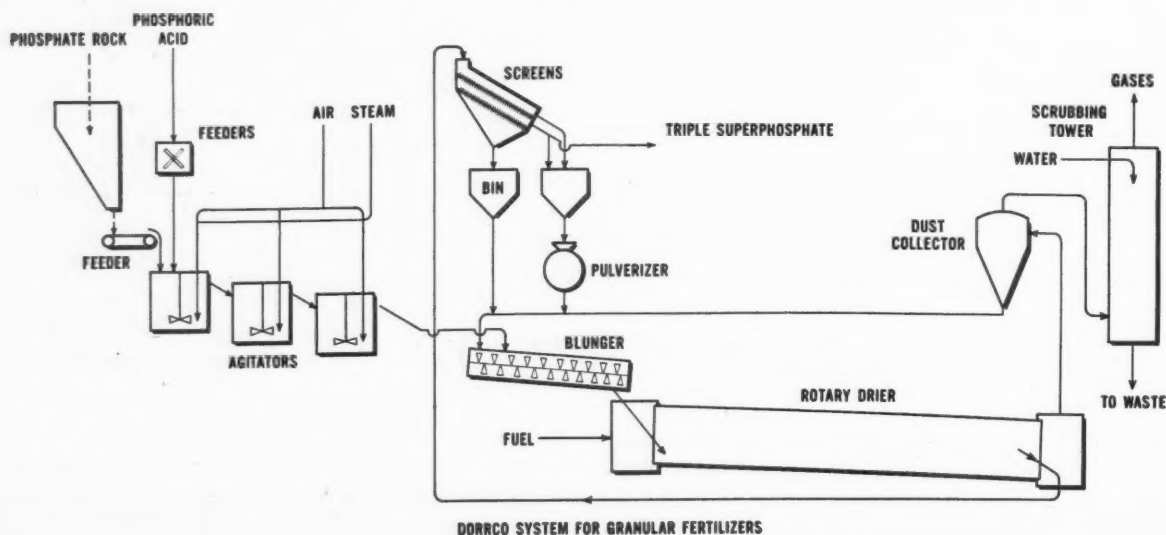
Briefly, acid of 38 per cent P_2O_5 is mixed with rock at a temperature of the order of $90^{\circ}C$. with a

supply of fluid slurry being obtained. This is used to add successive layers to recycled undersize granules which circulate through the drier and screening system until they are built up to the required size.

Oversize material is disintegrated and added to the undersize. The proportion of recirculated material may be 15 to 20 times that of the product.

The granule produced, according to the men, is perfectly spherical and much harder than that produced by any other process known to the men.

Frisken is works manager of the Immingham plant while Porter is production manager. Their paper dealt with the entire subject of manufacture of triple superphosphate, including history, chemical



reactions and general method of manufacture.

It concluded with the following sections on manufacture at Immingham and economic aspects, which are published here for study by other manufacturers:

Before proceeding to deal with the Immingham triple superphosphate plant in detail a brief general description may first be given of the factory as a whole. This is shown on cover. It occupies a site closely adjacent to Immingham Dock, near Grimsby, Lincolnshire, where excellent facilities exist for berthing the ocean going ships which bring in supplies of raw materials.

The latter are handled by grabbing cranes which feed a conveyor system connecting the quayside with the various large store buildings, i. e. phosphate rock store, sulfur store and salts store.

The factory's sulfuric acid is made in a sulfur-burning contact plant having a capacity of 250 tons monohydrate per day. Notable features of this plant are that it is a single-converter unit and that it includes a waste-heat boiler system which supplies the factory power station with approximately half its steam requirements.

Rock Grinding

The phosphate rock grinding plant consists of four Lopulco air-swept roller mills each rated to grind 12 tons/hour to a fineness of 80 per cent through 100 mesh.

The ground rock is transported by Fuller Kinyon pneumatic pumps to the three plants in which it is used—the single superphosphate, phosphoric acid and triple superphosphate plants. Single superphosphate is made in a Broadfield den.

The superphosphate produced, both single and triple, is conveyed to a large superphosphate store from which it can subsequently either be dispatched in bulk or fed to the granulating or bagging plants.

The granulating plant manufactures compound fertilizers which are conveyed to a large compound store from where they can later be dispatched in bulk or bagged. Bulk products can either be loaded from gravity hoppers to road or rail vehicles, or sent via a conveyor

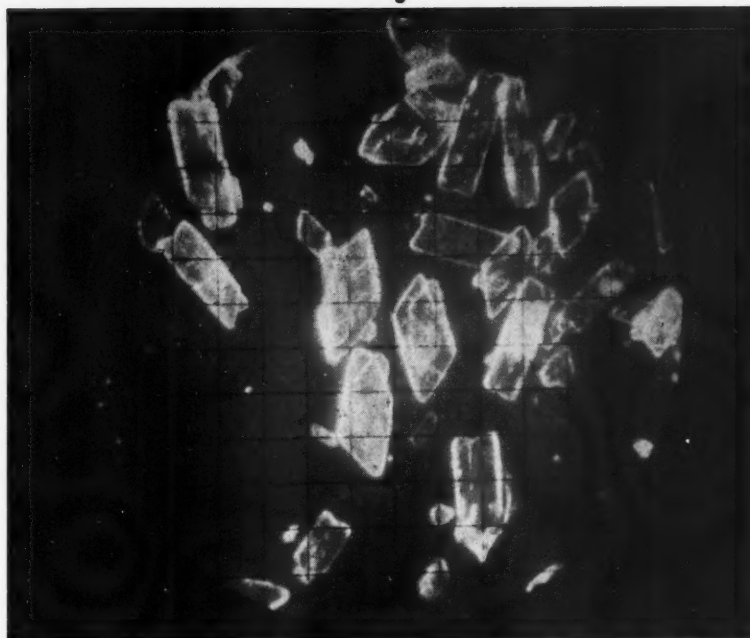


Fig. 9. Gypsum crystals from Immingham Phosphoric Acid Plant (0.1 mm. squares). Gypsum produced at Immingham has good filterability.

system to the quayside where they can be loaded to ship.

The bagging plant is housed at first floor level and the bags are conveyed by gravity down chutes to road or rail. The power station, workshops, stores and usual administrative and welfare blocks complete the principal buildings.

Annual Production

The factory was designed for an annual production of 70,000 tons of triple superphosphate, together with a quantity of single superphosphate and granular compound fertilizers.

Phosphoric Acid Plant

Phosphoric Acid manufacture might well form the subject of a separate paper, and we do not propose to go into great detail in describing the Immingham phosphoric acid plant. Nevertheless a general description will no doubt be of interest.

As is well known the wet process involves essentially the treatment of ground phosphate rock with sulfuric acid in the approximate proportion of three mols. of acid per mol. of tricalcium phosphate, leading to the formation of phosphoric acid containing gypsum in suspension, which must be separated by some suitable means.

The Immingham phosphoric acid plant was built to the design of the Dorr Co., Inc. of Stamford, Conn. as modified to some extent by Fisons. It has the nominal capacity to treat 250 tons of rock per day.

It employs the Dorrco Strong Acid Process, which enables an acid of 32 per cent P_2O_5 to be produced directly. This is separated from the precipitated gypsum by filtration. The acid is finally concentrated by evaporation. The plant thus may logically be considered as consisting of three stages, that is reaction, filtration and evaporation. The building housing the plant is roughly L-shaped and contains two main operating floors in addition to the ground floor.

Two Features

The reaction stage which comprises two units in parallel is carried out in a series of agitated tanks arranged stepwise for gravity flow.

Two essential features of the Dorrco process lie in the use of a mixture of sulfuric acid and phosphoric acids for attacking the rock, and in the recirculation of a large proportion of the slurry from the last reaction tank back to the first.

This system permits the precipitation of gypsum crystals under the optimum conditions for efficient



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11-4 Chemical Pumps

Use of the right pump on each job means a real saving, Buffalo Pumps, Inc. states in a new 35-page book. And the company explains which pumps are recommended for use with various chemicals, along with diagrams, specifications and ratings in "Engineering Data & Pumps for the Chemical Industries." Code Number 11-4.

11-5 Roller Mill

Sulfur, sulfur bearing insecticides, field strength products and high concentrate mixtures all can be handled by

the Raymond Roller Mill, according to "Raymond Mills for Insecticides," a booklet published by Raymond Pulverizer division, Combustion Engineering, Inc. The booklet describes the roller mill, lists its features and tells why the company considers it outstanding for use by pesticide formulators. Code Number 11-5.

11-6 Reliance Motors

"All motors are not alike!" This statement is made by Reliance Electric and Engineering Co. in a booklet which goes on to describe construction features,

selection data and dimensions of its Precision-Built Motors. Code Number 11-6.

11-7 Phthalic Anhydride

A technical bulletin on Tetrahydro Phthalic Anhydride, which has application in pesticide production, is available from National Aniline division, Allied Chemical & Dye Corp. No particular hazards have been uncovered to date in handling or use of the white crystalline powder, according to the company. The material has a molecular weight of 152.1, a solidification point of 99-101°

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C. and a density at 105° C. of 1.20 g./ml. **Code Number 11-7.**

11-8 Weed Killers

Descriptions of Geigy weed killers and defoliators and recommendations for their application are given in a folder from the company. Also included is information on Geigy's new materials, removal of 2, 4-D from spray equipment, do's and don'ts in weed killer applications and other data of interest to the farm chemicals industry. **Code Number 11-8.**

11-9 Lightnin Mixers

A catalog designed to define a new and helpful approach to the modern science of fluid agitation has been published by Mixing Equipment Co., makers of Lightnin Mixers. Beginning with a brief description of processes that can be helped by agitation, it shows the technological advantages placed at your disposal by Mixco, without cost, to aid you in developing each process to its maximum efficiency. **Code Number 11-9.**

11-10 Valve Guide

Available to farm chemicals manufacturers is the "Lunkenheimer Guide

For Selecting Valves, Boiler Mountings and Lubricating Devices." Valves are grouped according to steam pressure ratings with a thumb index for easy reference. Other valves and products are listed according to class of service or class of product. **Code Number 11-10.**

11-11 2, 4-D Weed Killer

A list of weeds which can be controlled by General Chemical 2, 4-D Amine Weed Killer and general directions for its use on small grains, flax, corn, sugar cane, rice, pastures and for general weed control are contained in a folder from General Chemical division, Allied Chemical & Dye Corp. Also included are precautions when using 2, 4-D weed killers. **Code Number 11-11.**

11-12 Warren Pumps

Dependability . . . long life . . . maintained efficiency—all are claimed by Warren Steam Pump Co., Inc. for its pumps. Solvents, acids, organic liquids and hydrocarbons can be handled with Type DF pumps, according to the company. Dimensions, specifications, design advantages and other fittings of DF pumps are given in recent literature. **Code Number 11-12.**

11-13 Bagpak Multiwalls

Bagpak multiwalls have everything and hold almost anything, according to International Paper Co. Company literature states the special features include cushion stitch closure, preform top and bottom, range of sizes from 25 pounds to 110 pounds and a variation in plies to resist chemical and physical attack. **Code Number 11-13.**

11-14 Cyclonic Scrubber

Between 96 and 98 per cent of fluorine can be removed from superphosphate plant gases with a Chemico P-A Cyclonic Scrubber, Chemical Construction Corp. states in a recent booklet on the scrubber. Its high efficiency, low operating cost, low maintenance and low initial cost should be of interest to fertilizer manufacturers. **Code Number 11-14.**

11-15 Waterproof Bags

Bemis waterproof laminated-textile bags give five-way protection to their users. They guard against change of moisture content, sifting, escape of undesirable odors, loss from snagging and tearing and rough handling, according to Bemis Bro. Bag Co. Available in three or five layer construction depending upon your protection requirements. **Code Number 11-15.**

11-16 Hough Handbook

If you want to find out how to analyze, organize and set up an efficient handling system, The Frank G. Hough Co.'s "Bulk Materials Handbook" may contain the answers to many of your questions. It tells how and where to look for signs of inefficient bulk-materials handling and includes many useful tables and data. **Code Number 11-16.**

11-17 Pump Guide

"Practical Guide to Pump Selection" is the title of a booklet prepared by Taber Pump Co. Written by William F. Traudt, the booklet should be of value in selecting pumps for your operations. Information on rotary, centrifugal and vertical centrifugal pumps is included. **Code Number 11-17.**

11-18 Ser-X

Samples and complete information on Ser-X insecticide diluent are available from Summit Mining Corp. The company states that just one season trial by leading insecticide formulators has proven the diluent to be of superior quality. **Code Number 11-18.**

Reader Service inquiries will be honored up to six months after date of publication of the magazine in which they appear.

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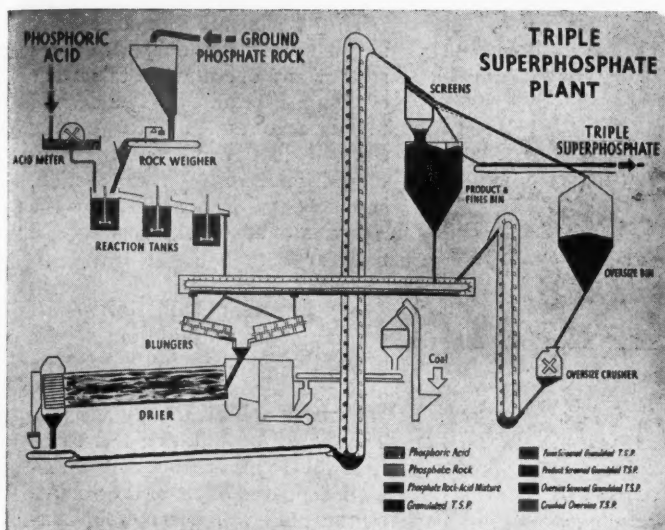


Fig. 10. A flowsheet of the plant is shown above. Both the triple super and phosphoric acid processes are cyclic ones.

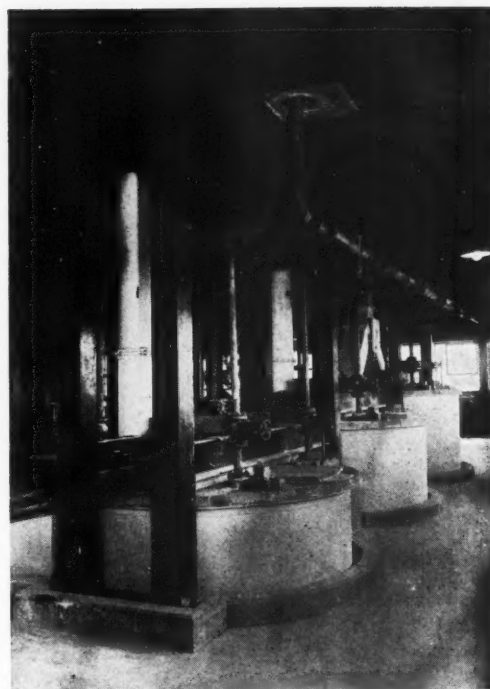


Fig. 11. (right) Three reaction tanks, called agitators, are placed stepwise for gravity flow in manufacture of triple super.

filtration, a point of the greatest importance.

In practice the gypsum produced at Immingham has excellent filterability. Fig. 9 shows a sample of it. The greater size and greater ratio of breadth to length of those in Fig. 9 make an immense difference to the rate of filtration and to the amount of liquid retained by the cake.

Control of temperature, which also is important, is achieved by means of an airblast into each tank. The reaction tanks are of steel, lined first with rubber and then with a further lining of acid resistant brick. The circulating pumps are of stainless steel construction. The evolved gases are vented to a gas scrubbing tower system.

Filtration of the slurry, together with two stage countercurrent washing of the gypsum, is effected on Landskrona-type vacuum belt filters. In principle these consist of an endless rubber carrier belt with upstanding sides carrying a perforated belt which in turn supports a filter cloth made of a suitable acid resisting fabric.

The perforated belt and the filter cloth are longer than the main belt and are independently supported on the return side; this enables them to be continuously

washed with water sprays, a highly advantageous feature when dealing with wet process phosphoric acid because of its tendency to supersaturation with gypsum and fluosilicates and hence to severe scaling.

Acid of two strengths is produced by the filters: (a) the main product acid of 32 per cent P_2O_5 which passes on to the evaporation stage and (b) the product of the two stages of washing which contains 22 per cent P_2O_5 and which is returned to the reaction system.

Acid Evaporated

Evaporation of the filtered 32 per cent acid to a strength of 38 per cent P_2O_5 is carried out in single effect vacuum evaporators, the bodies of which are of cast lead. The calandria tubes are of carbon (Karbate) supported by tube plates of homogeneously lead lined steel. In order to minimize the amount of scaling in the evaporators, the latter are arranged in circuit with a thickener, and the liquor is continuously recycled. This enables most of the precipitate to be removed in the thickener, but even so frequent "boiling out" of the evaporators is found to be necessary.

The triple superphosphate plant was designed by the Dorr Co., Inc.

It has a nominal rated capacity of 230 tons of product per day and is housed in a seven-story building 106 ft. high to the eaves, so that the maximum advantage can be taken of gravity flow of materials.

A flowsheet of the plant is shown in Fig. 10. It will be noted that, as in the manufacture of phosphoric acid, the process is again a cyclic one, fines and crushed oversize being continuously recirculated.

The phosphate rock which has been ground to 80 per cent through 100 mesh is delivered by the Fuller Kinyon system to a 120 ton storage hopper. In order to give maximum ease of discharge this hopper has two vertical walls and two sloping walls inclined at 35° to the vertical.

Air Jets Used

Air jets are provided for refluidizing the rock after a shut-down. Beneath each hopper is a totally enclosed screw conveyor which feeds on to a belt weigher. As the weight of rock on the belt varies, a shutter in the weight beam interrupts a beam of light focussed on to a photoelectric cell which modulates the speed of the motor driving the screw conveyor.

A feed of ground rock at a constant predetermined gravimetric rate thus is obtained. This is a

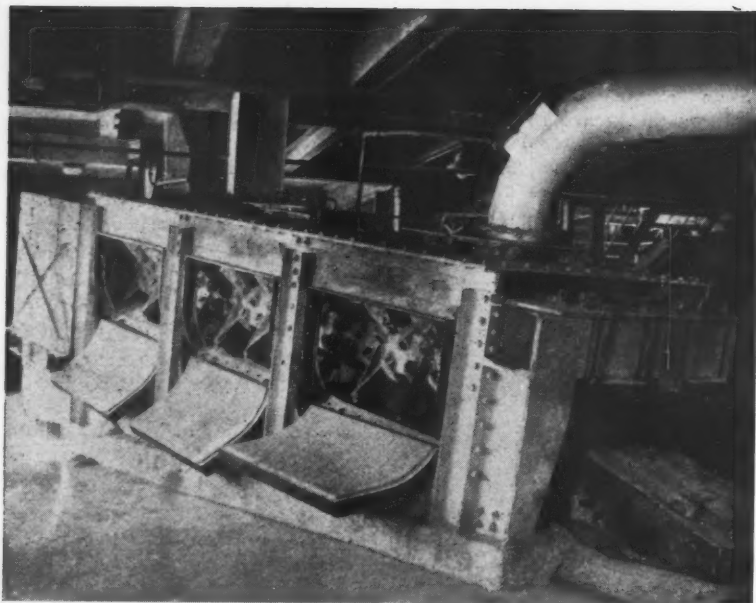


Fig. 12. Blungers used in making triple superphosphate. Material leaving the Blunger has the appearance of being practically dry, in practice.

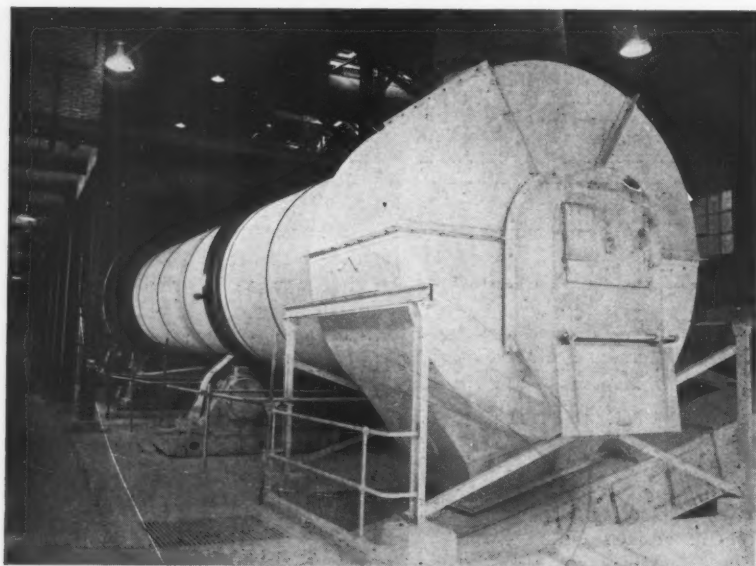


Fig. 13. Rotary drier for triple super which revolves at 5 r.p.m., is driven by a 150 h.p. motor and is heated by hot combustion gases.

most important factor in successful operation. Because of the considerable variation in the bulk density of phosphate rock, especially when finely ground, volumetric feeding is much too inaccurate. Phosphoric acid at a strength of 38 per cent P_2O_5 is fed at a known volumetric rate through a cup-feeder drive by a DC motor; speed variation is obtained by rheostat control.

The two reactants in the desired proportions flow through three re-

action tanks, known as agitators, in series. These are seen in Fig. 11. They are circular mild steel vessels each of seven cubic meters capacity, arranged stepwise for gravity flow, the construction being of lead lined mild steel with a further internal protective lining of acid-resisting brick.

In each tank a vertical shaft driven by a 20 h.p. motor carries a number of impellers for agitation purposes, the whole being in stainless steel construction.

The tanks are connected by means of a side launder with gates so that any one may be taken out of circuit if required. The desired temperature and fluidity of the slurry is obtained from the exothermic nature of the reaction, supplemented or controlled by the injection of steam or air as may be necessary.

Physical Condition

The physical condition of the magma is very interesting. The first agitator is frothing violently, and the material is very viscous. The degree of agitation has to be carefully adjusted to insure maximum expulsion of gas or the volume of the pulp will become so enormous that detention time will become insufficient.

In such case a mixture of acid and still reacting rock will pass to the subsequent steps in the process; such a mixture will not granulate and will seriously affect the product. In the second and third agitators the pulp thins out and runs readily to the next section of the plant where it meets the circulating solids and granulation occurs.

Granulation

Granulation is effected in a horizontal twin-shaft paddle mixer known as a Blunger, which is a machine of extremely rugged construction. Its approximate dimensions are 15 ft. long by 5 ft. wide by 3 ft. 4 inches deep in the form of a trough.

The two parallel shafts are geared together and each carry a series of rugged blades which intermesh in operation; the tips of the blades are renewable. The body is set on a slope to facilitate movement of the material.

A 100 h.p. driving motor is installed, although this has a very considerable margin to enable it to cope with exceptional conditions; in normal operation the power required is of the order of 50 h.p. Two Blungers are installed in parallel to insure continuity of operation during cleaning and maintenance. The sides consist of detachable panels to facilitate this work.

The effect of the thorough incorporation of the slurry with the recirculated "fines" (i. e. undersize from the product screens plus disintegrated oversize) which occurs

in the Blunger is to coat the individual particles of fines with a thin film of slurry. In practice the material leaving the Blunger has the appearance of being practically dry.

After subsequent passage through the drier each particle has acquired an additional "skin," and repeated passage round the cycle ultimately results in the granules reaching the desired size for removal by the screening section. Considerable moisture is vaporized in the Blunger and is vented along with the drier gases.

The discharge from the Blunger falls down a steep chute into a large rotary drier, 10 feet in diameter by 80 ft. in length, situated on the ground floor. This is shown in Fig. 13. It revolves at 5 r.p.m. and is driven by a 150 h.p. motor. It is heated by hot combustion gases from an adjacent coal-fired furnace fed by an underfeed mechanical stoker.

The gases and product flow concurrently through the drier, and automatic control of gas temperature is maintained. Normally the inlet and outlet temperatures are of the order of 350° C and 90° C respectively.

The internal construction of the

drier comprises a combination of chains and lifters. At the outlet end there is a discharge grizzly having bars of approximately one inch spacing, which separates any lumpy aggregates. The latter material, which is very small in amount in normal circumstances is knocked through a grid before rejoining the product. The exhaust gases pass through a cyclone system for removal of dust before being delivered by fan to a wash-tower constructed of acid-resisting brick.

Removed on Belt

The product from the drier is removed by belt conveyor to the main elevator, which carries 30 inch buckets and elevates between 96' 6" centers, requiring 50 h.p. for its drive and being capable of handling 235 tons/hour. This elevator transports the product to the top of the building, where the screening section is situated, and from where gravity can be used for all subsequent movements between successive steps to complete the process cycle, with one exception.

The screens are of the double-deck, electrically vibrated type. The exact mesh sizes may be varied in accordance with the granule size

of product desired; currently the upper screen has openings 2" x 0.131", and the lower screen 2" x 0.095". The material thus is divided into three streams, fines, product and oversize. Fines and oversize pass to separate storage bins.

In order to insure a sufficient supply of circulating material before any product is drawn off, the product also passes to the fines bin, but is separated from the fines by a baffle in the upper part of the bin as indicated in the flow diagram.

The result is that when the level is low in the bin, both materials mix and are drawn off from the bottom. After the level rises above the bottom of the baffle, however, the two materials are in separate compartments and product can be drawn off from the side of its compartment and carried by a conveyor system into the superphosphate store.

Fan is Used

A dust extraction fan is used to vent various points in the system, notably the screens, elevators and hoppers, and the dust is collected in a separate cyclone system. The air passing the cyclone is scrubbed

Specimen savings through using 47 per cent as distinguished from 18½ per cent superphosphate.

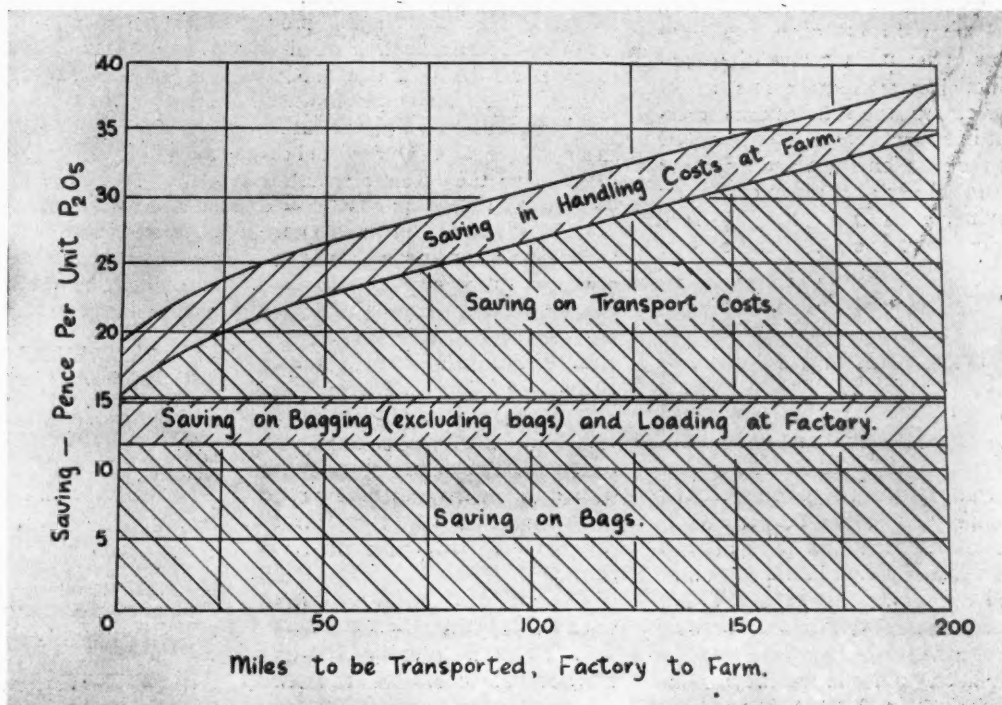


Fig. 14
Specimen
Savings

in a wash tower before discharge.

The oversize is reduced in size in a 36" x 48" swing-hammer pulverizer, of which two are installed in order to permit the necessary routine cleaning in view of the build up which occurs in operation. These machines are very strong and are driven by 120 h.p. motors. Their nominal capacity is to reduce 45 tons/hour from one inch cube to less than eight mesh. The hammers are readily renewable, but may be used in four different positions before being scrapped. The cracked oversize passes to an elevator (this and the main elevator are the only two in the plant) delivering onto a horizontal scraper conveyor known as the Fines Conveyor, which is 51' 9" long between centers.

Fines also are fed from the fines hopper onto this conveyor, as well as material collected by the two cyclone systems; the latter forms an important part of the returned fines. This conveyor thus receives all the circulating material and discharges it into one or other of the two Blungers as described above.

The plant, in common with the phosphoric acid plant, and indeed the whole factory, is well instrumented. Where possible the instruments are mounted on central control panels.

It may be of interest to note that under present operating conditions approximately five to 10 per cent of the total fluorine present in the acid and rock is removed in the reaction stage and a further 30 to 40 per cent removed during drying.

Economic Aspects

The table gives our approximate estimate of the raw material, operating and service requirements of a Dorr-type triple superphosphate plant operating on Morocco phosphate under conditions such as obtained at Immingham.

Under normal conditions a P_2O_5 recovery of at least 98 per cent is achieved. It should be mentioned that our experience of operation at full output at Immingham is not yet extensive, and it may be that the service requirements will be modified to some extent in due course. It is already abundantly

Liquid Process

The Dorrco "liquid" process used at Immingham is the only one in operation in England making a granulated product, as distinguished from the "solid" processes yielding a powdery material. The Fisons product made by the liquid process has this typical analysis:

	Per Cent
Total P_2O_5	50.8
Citrate Insoluble P_2O_5 ...	1.0
Available P_2O_5	49.8
Water soluble P_2O_5	47.5
CaO.....	22.5
F.....	1.9
Free H_2O on ground sample dried at 100° C. two hours.....	2.4
Free acid, as P_2O_5 , extracted with dioxanacetone.....	3.3
Free acid as P_2O_5 , by water soluble extract titrated to pH 4.5.....	6.6
SO_3	3.2
Fe_2O_3	1.5
Al_2O_3	0.5
SiO_2	0.5
Bulk density of the granules is approximately 60 pounds per cubic foot.	

clear to us that well-organized maintenance is the key to successful operation of this type of plant.

It may be of interest to compare the economics of this "liquid" process with the alternative of first using the Broadfield den "solid" process to produce a powder material and subsequently granulating as a separate step. Our limited experience of the latter alternative suggests the following conclusions:

1. In the solid process there is a slight but appreciable economy in phosphoric acid, no doubt arising from the lower temperature at which the reaction is conducted, and hence the lower degree of attack on the impurities in the rock.

2. The above economy is partly offset by the necessity for using a more concentrated phosphoric acid in the "solid" process. In our case we have found it desirable to use acid of 46 per cent P_2O_5 , as compared with 38 per cent.

3. Comparing very broadly the overall costs of the two processes as they might be con-

ducted at Immingham, there is no marked difference between the two. A different conclusion, however, might well be reached under different circumstances where availability of existing plant compared with the necessity for spending fresh capital might well affect the issue.

4. Comparing the physical properties of the two granular products the "liquid" process is markedly superior. It results in a much harder granule of more regular shape, as would be expected from its mode of formation, and accordingly is likely to prove more satisfactory to the customer.

Concentrated Product

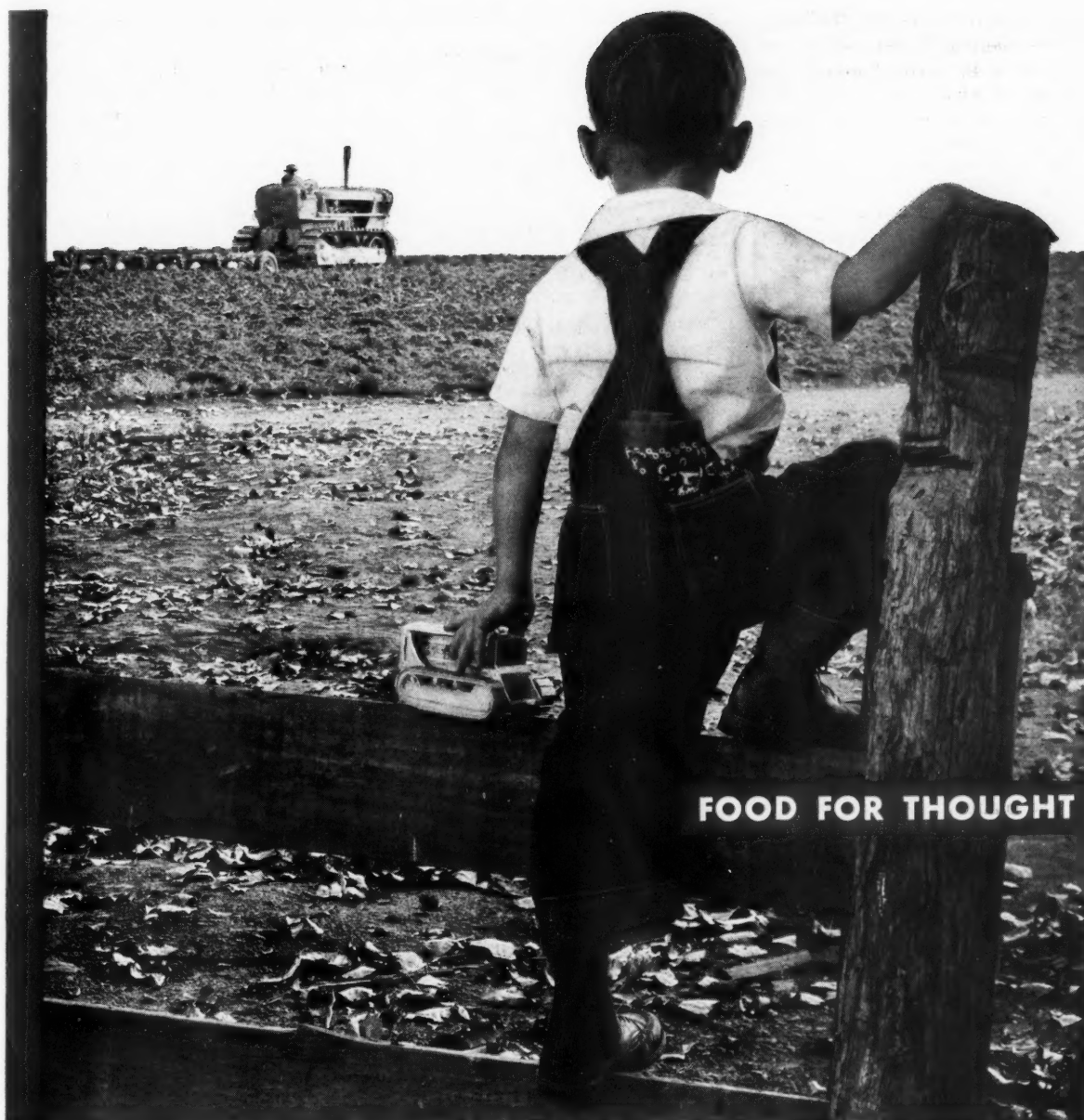
It has been stated (9) that with modern technique of manufacture of phosphoric acid it is now possible in a large plant to produce triple superphosphate at a cost per unit of P_2O_5 approaching very nearly that of the unit price of P_2O_5 in single superphosphate. While a great deal depends on the types of process chosen and on local circumstances, we do not seriously quarrel with this statement, assuming that it refers to the bulk product at works. In making the comparison one must naturally compare granular triple superphosphate with granular single superphosphate, and similarly for the powder materials.

One of the main virtues of triple superphosphate lies in the lower costs of bagging and loading, transport to the farm, and farm handling costs per unit of P_2O_5 as compared with single superphosphate. It is particularly attractive when P_2O_5 has to be delivered to an area a long way from the factory.

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(Continued on page 70)



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While man supplies labor and knowledge, it's the soil that supplies the strength responsible for the growth of all living things. For from the soil come the vital plant-food elements that nourish all life. And to the soil these elements must be returned.

Many of the most effective soil-replenishing fertilizers contain POTASH, often Sunshine State Potash, a product of New Mexico. For Potash nourishes the soil with active ingredients that make for bumper crops and larger profits. Potash is a valuable profit-producing aid.

UNITED STATES POTASH COMPANY, Incorporated, 30 Rockefeller Plaza, New York 20, N. Y.
 NOVEMBER, 1953

Philadelphia, Nov. 30 - Dec. 5 . . .

Industry Interest High In Chemical Exposition

REPRESENTATIVES of fertilizer and pesticide manufacturers are expected to be present in large numbers at the mammoth Exposition of Chemical Industries scheduled for Philadelphia Nov. 30 to Dec. 5.

The exposition, biggest of its kind ever held, will include four acres of exhibits in the city's giant Convention Hall and Commercial Museum.

The show should be of especial interest to members of the farm chemicals field because it will include latest equipment for reduction of ores, convertors, bins, chutes and conveyors for dry materials and tanks, pumps, piping and valves for liquids.

500 Exhibitors

Nearly 500 exhibitors are expected to display equipment or special processes at the exposition, 24th annual display of its kind. Of the exhibitors, 140 will be represented at the exhibition for the first time.

Chemicals represented will range from rare and refined substances available only for research, through reagents for the laboratory to the commercial grades available in quantities. Materials will be shown in rare and fabricated forms and in parts shaped to customer specifications. Specialties, such as instruments, laboratory equipment and supplies will be demonstrated in finished form and in working models and animations.

A large part of the exposition will be given over to production

equipment, exhibited for the most part in complete units, ready for installation in plants, but frequently demonstrated by cutaway models, transparent sections revealing material in simulated processing or flow-charts and action displays.

With the increasing trend toward custom-tailored and specially designed equipment in fertilizer and pesticide plants, much interest should center on one booth illustrating facilities for designing and building industrial units, showing actual equipment used in sample plants.

Drying Equipment

A manufacturer of drying equipment will bring to the exposition from his own laboratory a gas-fired continuous rotary dryer and a continuous indirect heat rotary calciner.

"These units enable the heat processing engineers to determine the rate of feed, time cycle, temperature, special specifications before the production unit is built," the manufacturer explains. This assures efficient and satisfactory operation of the plant size production equipment.

Officials in charge of arrangements for the exposition report attention will be paid to the idea of adapting equipment to the plant, rather than the plant to the equipment. Remote indicating instruments and control equipment for installation in custom panels in control desks will be exhibited. A manufacturer of grinding and dis-

bursing equipment will show a tandem combination for taking bulk products and reducing them to a controlled particle size without any rehandling.

Study Model

A unique exhibit will be one which demonstrates the effectiveness of translating hundreds of ideas, sketches and blueprints into a three-dimensional model for use as a study and reference tool. As a new engineering service, scale models of a projected plant are built in the design office in parallel with the design. Such models may be used for obtaining bids on contracts, for scheduling production or for training personnel.

The exposition will be closed to the general public, but open to the press and those associated with the management and technical phases of the chemical and process industries.

Purpose of Exhibit

Stated purpose of the exposition is to acquaint the chemical and allied industries with the latest developments in large scale production methods. Its managers claim it is the traditional source of information on improvements in manufacturing plants and the planning of new industrial developments.

Producers of chemical materials as well as manufacturers of structural materials will be represented.

The exposition will open Monday, Nov. 30, at 2 p.m. and will be open daily from 11 a.m. to 10 p.m. except Wednesday and Saturday, when it will close at 6 p.m. ♦

FARM CHEMICALS

FERTILIZER MATERIALS MARKET

New York

October 12, 1953

Sulfate of Ammonia

No change was reported and shipments were going out against existing contracts. Demand was reported slow and supplies ample to cover buyers' needs.

Nitrate of Soda

With both domestic and Chilean material priced lower since September, a better movement is looked for as this material now is more in line, price-wise, with imported materials of a similar nature.

Ammonium Nitrate

Supply picture seems to be a little better because of the easing in demand for other forms of solid nitrogen. However, producers are sold out for the current season.

Urea

Material available for import at prices ranging from \$125 to \$130 at the port. Demand is slow at present time and supplies ample.

Nitrogenous Tankage

Some of this material has been booked for shipment early next year at prices ranging from \$3.75 to \$4 (\$4.56 to \$4.86 per unit N), according to shipping point. Because many buyers have held off their purchasing, a better demand is expected within the next 60 days.

Castor Pomace

Material is offered at \$27.50 per ton, f.o.b. production points, for shipment between now and the end of this year. Because of the lower price, demand has increased considerably from various sections.

Organics

Fertilizer buyers were limiting their buying of organic fertilizer materials to their immediate needs. Before buying their season's requirements they prefer to wait until they can get a better picture of the amount of fertilizer that may be used next Spring. Tankage and blood last sold at \$5.50 per unit of

NOVEMBER, 1953

ammonia (\$6.68 per unit N), f.o.b. Eastern points, with some producers now asking \$6 (\$7.29 per unit N). Soybean meal in bulk for immediate shipment was quoted at \$59 per ton, f.o.b. Decatur, Ill. Linseed meal and cottonseed meal were quiet.

Fish Meal

Menhaden fishing still was in progress in Virginia and North Carolina and ground fish meal was selling at about \$133 per ton, f.o.b. fish factories at those points. Demand for fish meal from some sections has slowed down because of lack of interest from the feed trade.

Bone Meal

A better demand has developed for bone meal from both the fertilizer and feed trade with last sales made on the basis of \$55 per ton, f.o.b. shipping points.

Hoof Meal

Very little trading has taken place recently in hoof meal and most of current production is going for industrial purposes. Last sales on basis of \$6 per unit (\$7.29 per unit N), f.o.b. Chicago.

Superphosphate

With several large government inquiries in the market for export, better demand is expected shortly. Domestic buyers, however, have covered their needs for the coming season and no shortage is expected, although triple superphosphate is in good demand.

Potash

Shipments against contracts were reported rather slow but most producers looked for a pickup as soon as many of the smaller mixing plants go back in operation.

Philadelphia

October 12, 1953

The raw materials market continues quite dull. Nitrate of ammonia seems to be the one article that is in short supply. Other materials are readily obtainable but

mixers' plants are pretty well choked up with complete fertilizer which farmers are not taking. Accordingly, stocks of sulfate of ammonia, potash and superphosphate are accumulating in producers' hands.

Sulfate of Ammonia.—There is ample domestic supply of this material, and foreign offerings are abundant. Some domestic producers are reported to have reduced the price to \$44.50 per ton at the ports.

Nitrate of Soda.—Market is quiet with ample stocks and no abnormal demand.

Blood, Tankage, Bone.—Blood is somewhat stronger at \$5.50 per unit of ammonia (\$6.68 per unit N), New York basis, and \$6 (\$7.29 per unit N), Chicago basis. Tankage is listed at \$5.50 to \$6.25 per unit (\$6.68 to \$7.59 per unit N), depending upon location. Bone meal is quiet at \$55 per ton, while hoof meal remains nominal at \$6 per unit of ammonia (\$7.29 per unit N), Chicago.

Castor Pomace.—This is quiet and lower at \$27.50 per ton.

Fish Scrap.—This is more or less nominal at \$125 per ton for the scrap, and \$129 to \$134 for meal.

Phosphate Rock.—Movement is rather slow because of limited contract withdrawals. The supply position is said to be satisfactory.

Superphosphate.—Stocks are adequate but not moving out at normal rate to mixers, since the latter cannot get rid of their mixed goods. Farmers are unusually slow in ordering and taking delivery. Market remains steady.

Potash.—Market is very quiet at 43 cents to 45½ cents per unit K₂O per ton, with movement against contracts exceedingly slow.

Charleston

October 12, 1953

Movement of mixed fertilizers, particularly in the areas where

there has been little rain for many months, is quite slow at present. Some manufacturers are carrying heavy inventories of raw materials because of the slow movement of mixed goods.

Organics.—Rather little interest in fertilizer organics is shown at present, but producers of nitrogenous tankage are in comfortably sold position at prices ranging from \$3.15 to \$4.65 per unit ammonia (\$3.83 to \$5.65 per unit N), bulk, f.o.b. origin point. Limited offerings of imported nitrogenous tankage are indicated at around \$4.50 to \$4.75 per unit of ammonia (\$5.47 to \$5.77 per unit N), in bags c.i.f. Atlantic ports.

Castor Pomace.—Domestic production currently is indicated at \$25 per ton in bags, f.o.b. Northeastern production points. Importers' prices vary from \$30 to \$40 per ton, bagged, f.o.b. cars South Atlantic ports.

Blood.—Dried unground blood in bags is indicated in Chicago at approximately \$6.75 to \$7 per unit

of ammonia (\$8.20 to \$8.51 per unit N). The New York market on ground material in bulk is approximately \$5.50 to \$6 (\$6.68 to \$7.29 per unit N).

Potash.—No change has been noted in the price of domestic potash, and because of drought conditions in most parts of the country, movement is not as heavy as it should be for this time of year. Imported material is indicated at approximately 57 cents down to 50 cents per unit K_2O , bulk, ex-vessel Atlantic and Gulf ports for muriate of potash.

Ground Cotton Bur Ash.—This source of potash, primarily in the form of carbonate of potash, is available for prompt and future shipment at prices approximating the delivered cost of domestic sulfate of potash. Analysis currently is 38 per cent to 42 per cent K_2O .

Superphosphate.—Twenty per cent grade superphosphate continues in good supply and production is steady. Prices are firm. Triple superphosphate, in spite of

increased production, continues somewhat short of demand. Current price is 98 cents per unit A.P.A., bulk, f.o.b. Tampa.

Phosphate Rock.—Prices remain firm at previous level, and domestic demand is rather steady.

Sulfate of Ammonia.—During the past week a number of domestic producers have announced that they will meet the competition of imported sulfate of ammonia down to a basis of \$44.50 per ton, bulk, f.o.b. South Atlantic ports.

Nitrate of Soda.—Stocks continue adequate both of imported and domestic production. No changes have been noted in the price that became effective Sept. 1.

Calcium Ammonium Nitrate.—Stocks at several ports are available at \$51.25 per ton in bags, f.o.b. cars at Atlantic and Gulf ports.

Ammonium Nitrate.—Demand still exceeds supply at prices that have been in effect for the past several months.

Allstetter: Tell the farmer about dollars!

FARMERS usually apply fertilizer to increase their earnings—not to prove scientific theories.

That was the key statement in a talk given by W. R. Allstetter at the New Jersey Fertilizer Conference on Sept. 24.

The National Fertilizer Association vice president went on to declare:

"Fertilizer usage should be explained to farmers in terms of its effect on his profits per acre and his unit cost of production. In order to accomplish this result, response data must be analyzed from the standpoint of economics."

Allstetter spoke on the subject "What the Fertilizer Industry Desires in Institutional Research."

He said the fertilizer industry almost unanimously supports an expanding program of basic agricultural research in applied science.

He added that its representatives are salesmen of applied science and said "our theme is that the application of test-proven scientific



W. R. Allstetter

methods is profitable for the farmer, increases the standard of living of both rural and urban groups and creates national strength in time of world crisis."

Continuing his emphasis on economic interpretation of fertilizer data, Allstetter said he was sure the ferti-

lizer salesman would be much better at his job "if he were armed with data from his Land-Grant College showing what effects on costs and profits could reasonably be expected from a given use of his products."

Commenting on the approximate half-million dollars being spent in the United States every year in agricultural research and education, the NFA official asserted that the measure of whether the purpose of these expenditures is being accomplished "is the extent to which farm practice is affected."

"Speaking as a layman," he continued, "I don't see evidence that a great deal of organized effort is being put into the study of how to market experiment station results to farmers."

Allstetter reiterated his request that research data be evaluated in "dollars-and-cents terms" when it is released.

The conference was held at the College of Agriculture in New Brunswick, N. J. ♦

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Industrial News

New Products

New Plants

New Appointments

Benson Changes USDA Groups

Agriculture Secretary Ezra Taft Benson last month announced, and this month put into effect, a plan to reorganize the USDA, designed to give "better service to farmers through placing operations of the department on a more business-like, efficient and decentralized basis."

The four main groups provided by the reorganization and agencies which will be included in them are:

1. Federal States Relations—Agricultural Research Service, Forest Service, Federal Extension Service, Soil Conservation Service, Agricultural Conservation Program Service and Farmer Cooperative Service.

2. Marketing and Foreign Agriculture — Agricultural Marketing Service, Foreign Agricultural Service and Commodity Exchange Service.

3. Agricultural Stabilization—Commodity Stabilization Service (including administration of Commodity Credit Corp. programs), Federal Crop Insurance Corp. and Community, County and State Committees.

4. Agricultural Credit—Farmers Home Administration and Rural Electrification Administration.

According to Secretary Benson, "This reorganization streamlines the department for better service to farm families and for simplified internal organization."

Crawford Joins Hough As Advertising Manager

Madison L. Crawford recently joined The Frank G. Hough Co. as advertising manager.

He formerly was associated with the advertising and sales departments of General Foods and Clark Equipment Co. During the past six years, Crawford has been associate advertising manager of Clark's Industrial Truck division.

Promoted



W. F. Jacobi

Sales, service and administration of all multiwall packaging machinery sold by Union Bag & Paper Corp. will be handled by the company's newly-created Multi-wall Machinery department, headed by William F. Jacobi.

Jacobi has been with Union since 1946, serving most recently in the company's Market Research department.

Industry Mourns Porter's Death

After an illness of several weeks, Lewis G. Porter, chief of Fertilizer Staff, Office of Materials and Facilities, PMA, USDA, died on October 14 at Alexandria Hospital, Va.

Prior to joining the USDA in 1933, he was engaged in various phases of the fertilizer business and was one of the pioneers in promoting use of synthetic nitrates and concentrated fertilizer materials.

Porter's first position in the USDA was as land bank appraiser. He later served in other capacities including senior technologist on fertilizer manufacturing and distribution, Office of Agricultural War Relations and industry specialist, War Production Board.

In the position he held at his death, he had been responsible for development of policies and programs within the department pertaining to the U. S. supply and commercial distribution of fertilizer and liming materials.

He served as a member of the Departmental Fertilizer Committee and was recognized as one of the Nation's foremost fertilizer authorities.

New Trends in Fertilization Set for Meeting December 7

A PANEL discussion, talks by leading agricultural college personnel, a USDA man and others will be heard on Dec. 7, when the National Joint Committee on Fertilizer Application and the Power and Machinery division, American Society of Agricultural Engineers jointly sponsor a fertilizer application program at the Edgewater Beach Hotel, Chicago.

Presiding at the morning session will be George B. Nutt, of Clemson Agricultural College, who is vice-chairman of the committee.

"History and Objectives of The National Joint Committee on Fer-

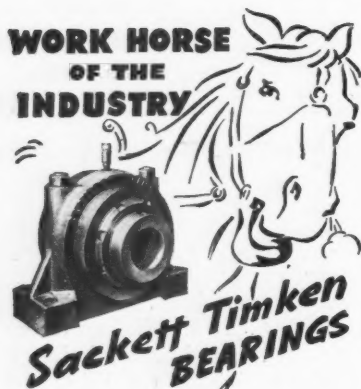
tilizer Application" will be explained by S. D. Gray, the committee's general chairman.

Dr. Firman E. Bear, professor of agricultural chemistry at Rutgers University, will discuss "New Horizons in Fertilizer Application."

Two talks on new developments are next on the program schedule.

"New Developments in Fertilizer Materials" to be presented by Edwin C. Kapusta, the National Fertilizer Association's chemical engineer, and "New Developments in Fertilizer Machinery" by C. A. Guelle, of International Harvester.

Last on the morning program is



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Industrial News

"Fertilizer Application in Practice" to be given by A. C. Thompson, owner of Thompson's Farms.

The afternoon session will be devoted to a panel discussion on "Placing Fertilizer for Efficient Production," with Kirk Fox, editor of *Successful Farming*, acting as moderator.

Panel members and the products they will discuss are G. A. Cummings, U. S. Department of Agriculture—corn; Leonard Lett, National Cotton Council—cotton; H. A. Woodle, Clemson Agricultural College—sod crops; Floyd W. Smith, Kansas State College—small grains and Thompson—vegetable crops.

Concluding the meeting will be a summary of the panel's comments by the moderator.

DuPont Says CMU Kills Weeds in Asparagus Beds

A new use has been found for CMU—that of controlling weeds in asparagus beds—according to E. I. duPont de Nemours & Co.

Low dosages of CMU are being used to control weeds in sugar cane and pineapple fields but asparagus, duPont states, is the first crop grown throughout the United States where use of CMU is applicable.

Field tests with CMU on asparagus have been conducted in Michigan, Massachusetts, Rhode Island, Washington, California, New Jersey, Illinois, Delaware and Pennsylvania. These tests are the basis for the recommendation of two to four pounds of CMU per acre. It can be applied either one to four weeks before cutting, immediately after the cutting season or at both times, according to duPont.

Farm Bureau Service Builds Granulation Unit

A new granulation plant is being built by Farm Bureau Service, Inc. in Kalamazoo, Mich.

Consisting of three major buildings, its expected yearly capacity is 30,000 tons.

The main building will house the manufacturing plant, the second store empty bags and the third

will contain office, cafeteria, change house and maintenance shop.

John J. Harte Co. engineers are handling design and construction management on the job, which is expected to be completed by January, 1954.

'Malathion' is New Name For Former 'Malathon'

"Malathion" is the new coined (generic) name for O-O-dimethyl dithiophosphate of diethyl mercaptosuccinate, formerly called "malathon."

Because of difficulty encountered in trade-marking the name selected first, American Cyanamid Co. decided to change the name to "malathion."

Both the American Chemical Society and the American Chemical Association were agreeable to the change, and in March the Interdepartmental Committee on Pest Control approved it as a generic name.

Potash Tours

Members and guests attending the American Society of Agronomy annual meetings in Dallas, Tex. have been invited to tour mines and refineries near Carlsbad, N. M. of five potash companies on Nov. 21.

Companies cooperating in the tour are United States Potash Co., Potash Co. of America, International Minerals & Chemical Corp., Duval Sulfur & Potash Co. and Southwest Potash Co.

ACP Convention

Officials of American Chemical Paint Co. last month evaluated results of its international convention which brought together chemical manufacturers of 42 nations at the company's plant in Ambler, Pa. and in Washington, D. C.

Most predominate fact, they stated, was that the convention was "unique of its kind," bringing together U. S. government officials, college experts and many representatives of private industry in foreign countries.

FARM CHEMICALS

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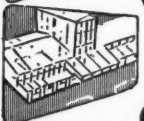
2 Plant Investment

We tell you before the contract is signed exactly how much the plant will cost. We protect you against unknown "cost plus" work.



3 Plant Design

We custom-design the building and all production equipment to meet the particular needs of your area of distribution. Further, we leave no stone unturned to incorporate the highest possible degree of production efficiency based on our wealth of specialized "know-how."



4 Building Construction

We construct the building from foundations to roof using the best materials obtainable in each component part. We include all electric power and lighting required including a power room, in which are located all motor controls for protection against usual dust and moisture conditions.



5 Equipment Manufacture

We fabricate in our own shops production equipment of the very latest design. Upon arrival at the site, we install this equipment with highly skilled men under the supervision of thoroughly competent field engineers. Upon completion of this work, each component part is thoroughly tested prior to the plant's initial operation.



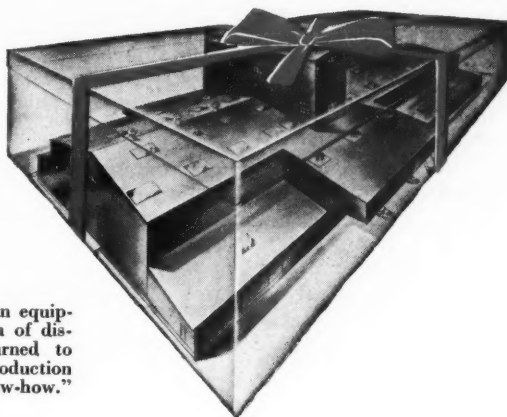
6 Guaranteed Performance

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After its initial startup, our Operations Engineer remains at your plant to thoroughly train your key production personnel.



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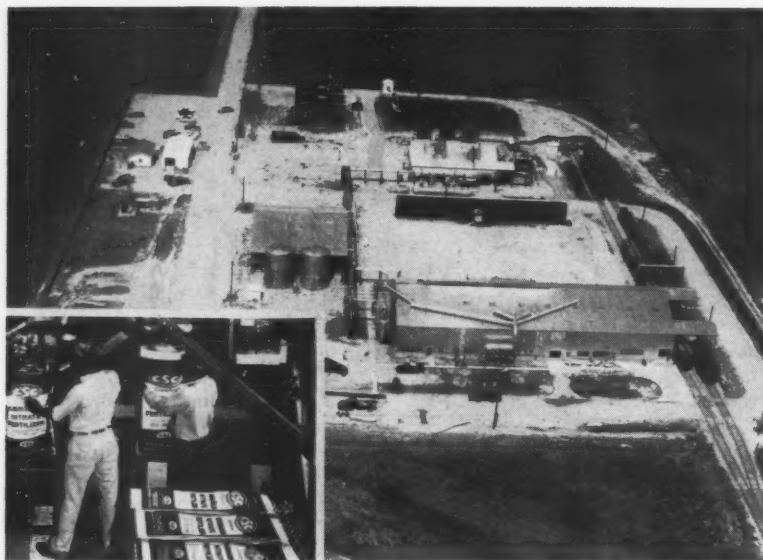
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Industrial News

Commercial Solvents Opens Plant



Aerial view of Commercial Solvents Corp.'s Pace Lake Unit, near Sterlington, La., which produces Ammonium Nitrate Fertilizer using Stengel Process. Inset shows workers filling and closing fertilizer bags.

When Commercial Solvents Corp. opened its \$20 million ammonia and methanol units in Sterlington, La. last month, many distinguished visitors were on hand to see it, including Sen. Allen J. Ellender (D-La.).

Constructed by Ford, Bacon & Davis Construction Co., with process design and engineering of the gas preparation unit by Chemical Construction Corp. and nitric acid plants built by Chemical & Industrial Corp., the Sterlington facilities will double Commercial Solvents' production of ammonia and methanol.

This plant, according to J. Albert Woods, company president, is the first of the chemical industry's privately financed post-war nitrogen expansion programs to be completed and in production.

Ammonia produced will be processed into approximately 75,000 tons of ammonium nitrate fertilizer and 30,000 tons of nitrogen solutions.

Another first claimed by Commercial Solvents is use of a unique new process which eliminates many expensive facilities and process steps in making ammonium nitrate fertilizer. It is housed in separate

buildings three miles from the Sterlington plant.

Called the "Stengel Process" after its inventor, Dr. Leonard A. Stengel of the company's Research division, the process eliminates conventional prilling towers, coolers and driers.

Addition of the methanol facilities makes Commercial Solvents one of the world's largest producers of methanol, with an annual output of 30 million gallons, Woods said.

Senator Ellender, who recently returned from a worldwide trip as a member of the Senate Appropriations Committee, and Woods were principal speakers at the opening ceremony.

Ammonium Sulfate

Because of lower-cost German and Belgian material, ammonium sulfate sales have been reported slowed, and stocks at domestic plants larger than normal.

Though preparation for fertilizer manufacturers requirements causes some stock accumulation at this time, many producers' future business expectations have been said to be dampened because of the present unsettled market condition.

MCA To Discuss Industry Problems

The Manufacturing Chemists' Association's semi-annual meeting to be held at the Waldorf-Astoria, in New York on Nov. 24 will be devoted to discussion of industry problems.

William C. Foster, association president, will open the general session and address the conference on "MCA—Present and Future."

Dr. Lionel D. Edie, president of the investment counseling firm of Lionel D. Edie & Co., will speak on "Factors Affecting the Business Outlook."

Monsanto Chemical Co.'s new film, "Decision for Chemistry," will be shown.

Panel discussions will be held on foreign trade and the tariff, depreciation, research correlation, antitrust laws and policy and plant maintenance and cost reduction.

Following a reception, the banquet is scheduled for 7 p. m. Hon. John J. McCloy, board chairman, Chase National Bank, and former high commissioner of Germany, will speak on various aspects of our foreign policy.

DDT Loses Leadership In Flea-Killing Field

DDT has lost its Number 1 position as a flea-killer, according to research conducted by the College of Medical Evangelists' School of Tropical and Preventive Medicine with flea-infested squirrels.

Dieldrin, aldrin and heptachlor all have been named as top flea killers, capable of dropping the bug count per squirrel from 111 down to one.

Nitrogen Hikes Wages

A wage increase of 12½ cents an hour was granted to 750 employees of Nitrogen division, Allied Chemical & Dye Corp.'s plant at South Point, O.

Management and the employees, represented by United Steelworkers of America (CIO) Local 3687, last month signed a new one-year wage contract which enabled the boost.

FARM CHEMICALS

Industrial News

Bugs Get 'Heat Treatment' In USDA Testing Program

BUGS infesting stored crops are being given the heat treatment by USDA Agricultural Research Administration engineers and entomologists, working with state agricultural experiment stations of Nebraska, Louisiana and Texas.

Tests on wheat, rice and cottonseed indicate that high-frequency electromagnetic fields of force, employed in a process known as dielectric heating, have practical possibilities for controlling rice weevils in grain and pink bollworms in cottonseed, according to the researchers.

The dielectric heating processes' main advantage is that it can generate high heat uniformly throughout a large mass of material in very little time—often only a few seconds.

Roughly, here's how the system works:

Material to be treated is placed between two electrodes, connected to a high-frequency oscillator, or source of radio energy. The field of force generated by the oscillator surges back and forth between the electrodes millions of times per second. The material under treatment is itself a "dielectric," or non-conducting substance. Its molecules are stressed first one way and then another at great rapidity by the force of the alternating field.

This stress quickly heats the dielectric. Temperatures reached depend on the voltage applied to the electrodes, the distance between them and the length of time electromagnetic force is applied.

No appreciable damage to grain occurs below 160° F., according to germination, milling and baking tests. At the Nebraska station adult rice weevils were destroyed in 12 per cent moisture wheat heated to 128° F. in one second. Somewhat higher temperatures were required to kill younger stages of the insect.

Total kill of weevils in rice was obtained at the Louisiana station in 2.2 seconds by heating the grain to 123° F.

At the Texas station, pink bollworm larvae in 10 per cent moisture cottonseed were killed in 14 to 29 seconds at 170° F. This temperature, which was needed to assure 100 per cent mortality, is near the temperature at which damage to cottonseed may be expected, USDA reports.

All the above results are from tests of small grain samples treated in plastic boxes. With present conveyor-belt systems, similar results might cost up to five cents a bushel.

Current research goals are to find ways to cut this cost and obtain complete insect kills at lower grain temperatures.

Big Plant Maintenance Program Set for Chicago

Many phases of plant maintenance will be discussed at the Plant Maintenance and Engineering Conference to be held in the Conrad Hilton Hotel, Chicago, Jan. 25-27.

Fifty-nine sessions, three of them general, 16 sectional and 40 round-table discussions, have been planned for the conference, said to be the largest of its kind in the industrial field. L. G. Morrow, consulting editor of *Factory Management & Maintenance*, will be general chairman.

Clapp & Poliak, Inc., of New York are producers of both the conference and Plant Maintenance & Engineering Show, scheduled for Chicago's International Amphitheatre, Jan. 25-28.

Mathieson Earnings Up In 1953, Nichols Reports

Earnings of Mathieson Chemical Corp. for the nine months ended September 30 were \$13,806,153 or \$2.53 per share, according to Mathieson's president Thomas S. Nichols.

This represents a \$2,890,695 increase over the 1952 earnings for Mathieson and Squibb of \$10,915,458 or \$2 a share. The merger with E. R. Squibb & Sons took place Oct. 1, 1952.

Sales for the nine-month period and third quarter respectively were \$184,074,445 and \$60,385,994, compared with \$162,134,699 and \$54,536,509 for both companies prior to the merger in 1952.

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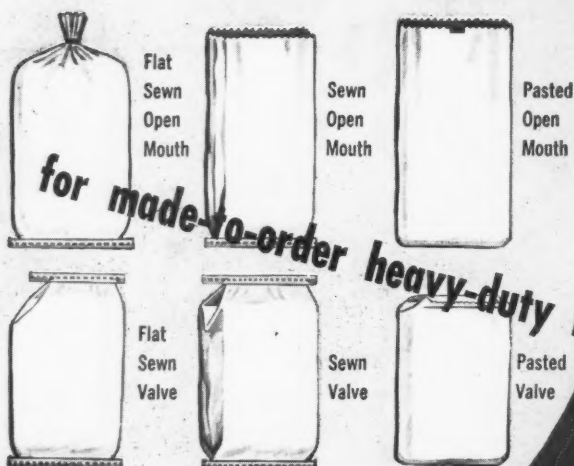
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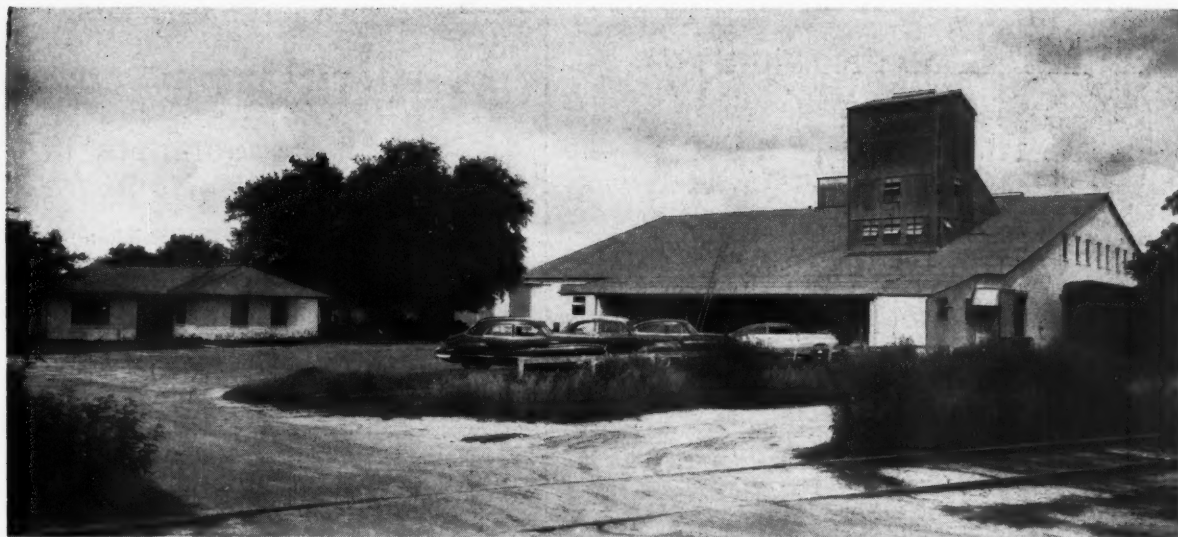
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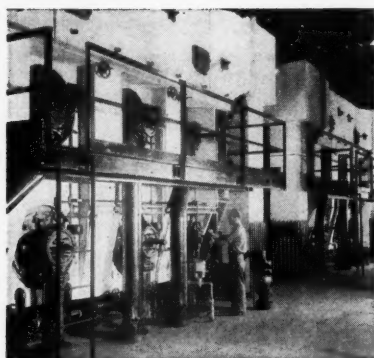
Completely integrated plants at Gilman, Vermont, and St. Marys, Georgia



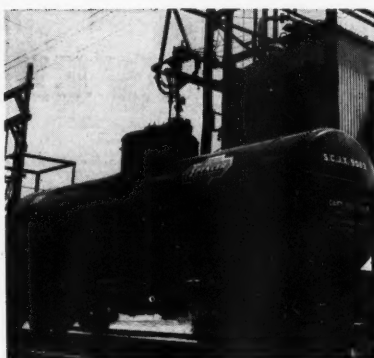
"Best On Earth" is the slogan of Foremost brand fertilizer which supplies growers in the Leesburg, Florida area. Established in 1947, this Foremost

plant has boosted production from 5,000 to 20,000 tons annually. N. A. Lockett is General Manager with W. J. Belding, Jr. as plant superintendent.

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C—\$103.00	F—\$173.00

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Charleston, S. C.

Industrial News

PMA Lists Pesticides By Availability for Use

Only four major chemical pesticides in 11 commonly used materials had greater availability for use during the crop year ended Sept. 30, 1952 than during 1950 and 1951, according to the Production and Marketing Administration, USDA.

PMA authorities listed the pesticides with greater volume of use as follows:

Benzene	
hexachloride	92,224,000 lbs.
2, 4-D, acid basis	25,298,000 lbs.
DDT	70,074,000 lbs.
2, 4, 5-T	2,937,000 lbs.

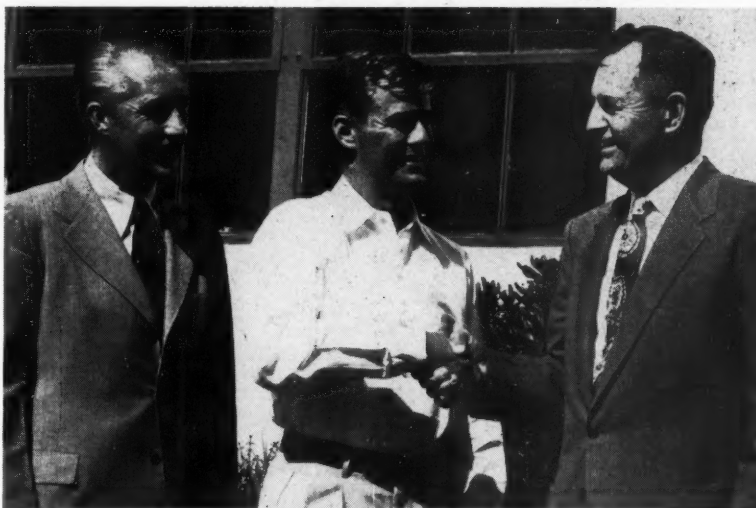
Reduced disappearance for last year's crop season was reported for calcium arsenate, lead arsenate, copper sulfate, parathion, pyrethrum flowers, rotenone-bearing roots and ground sulfur.

Grace to Continue Policies, Personnel at Davison

Davison Chemical Corp. policies and personnel remain the same following acquisition of a majority of Davison common stock by W. R. Grace & Co., according to reports from the company.

In a recent letter to Davison officers and staff, J. Peter Grace Jr., president of W. R. Grace & Co., expressed fullest confidence in existing personnel and policies and stated that it was the Grace company's intention "to continue the present successful policies affecting the personnel and the business generally."

CFA Awards Scholarship



George C. Martin, crops major at California State Polytechnical College, is shown receiving this year's California Fertilizer Association \$100 scholarship for an outstanding record in his studies and

in student leadership. Left to right: Roy Lonborg, member of crops department faculty at Cal Poly; Martin and Sidney H. Bierly, executive secretary and manager of CFA, who visited the college on Oct. 15 to make the award.

Using N in Fall

USDA plant scientists recently reported that late November is a good time to add supplemental nitrogen to apple orchards in the Middle Atlantic States.

Nitrogen applied in early winter normally will be washed down into the second foot of soil by spring. More of it then will be taken up by tree roots and less by grass roots, according to Dr. J. R. Magness, director of horticultural research,

Bureau of Plant Industry, Soils and Agricultural Engineering.

Arkell Gets Bag Patent

Arkell and Smiths recently was issued a patent covering a special valve formation on pasted multi-wall bags used for hydrated lime and other finely pulverized materials.

Trade marked under the name "Lock-Rite," it was designed to reduce sifting.

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Unexcelled for its superior Dehydrating, Neutralizing, and Curing factors in the preparation of better fertilizers. Write for complete information.

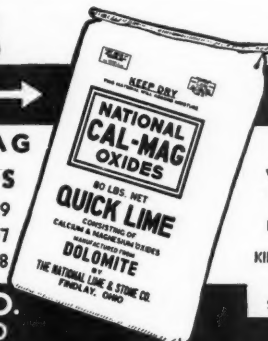
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HYDRATED
LIME (165 TNP)
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KILN DRIED RAW
DOLOMITE
(107 TNP)
Screened to size



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For Fertilizer Manufacturers



Nitrogen

FERTILIZER MATERIALS

LION ANHYDROUS AMMONIA—For formulation. A uniformly high-quality basic product. Nitrogen content, 82.25%.

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LION NITROGEN FERTILIZER SOLUTIONS—For formulation. Three types to suit varying weather and manufacturing conditions.

LION SULPHATE OF AMMONIA—For direct application or formulation. Large free-flowing crystals. Guaranteed nitrogen content, 21%.

TECHNICAL SERVICE—Lion provides special technical assistance for fertilizer manufacturers. Write to CHEMICAL SALES DIVISION for quick service.

LION OIL  COMPANY

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Industrial News

USDA Reports Results Of Pesticide Screening

Results of insecticide screening work carried out at Anaheim, Cal. in 1951 recently have been released by USDA.

Seventy-one esters of propionic acid were tested on six species of insects. Using more than 74 per cent mortality as the criterion of effectiveness, the following were reported successful by the researchers:

Two-spotted spider mite—2, 4-dinitro-6-biphenyl, pentabromophenyl and pentachlorophenyl propionates as 0.05 per cent sprays.

Armyworm — 2, 4 - dinitro - 6 - biphenyl and pentachlorophenyl propionates as 0.5 per cent sprays.

Large milkweed bug—*o*-cyclohexylphenyl and *p*-tert-butylphenyl propionates as 0.5 per cent sprays.

Pea aphids—*p*-bromophenyl, *o*-chlorophenyl, *p*-chlorophenyl and 2, 4, 5-trichlorophenyl propionates as 0.5 per cent dips.

Propionic esters reported effective against one or more species when used as 10 per cent dusts were 2-biphenyl; pentachlorophenyl; 2, 3, 4, 6-tetrachlorophenyl; 6-tert-butyl-*m*-tolyl; 2-bromo-4-tert-butylphenyl; *p*-cyclohexylphenyl; *m*-ethylphenyl; 2-naphthyl; *p*-nitrophenyl; and the dipropionates of 2, 4'-dihydroxybenzophenone and 1, 5-naphthalenediol.

Connecticut Changes

To centralize activities of the pest control branch of Connecticut Agricultural Experiment Station, its offices have been transferred from Danielson to the station's Tobacco Laboratory at Windsor.

Primary function of the office when established was to deal with outbreaks of the gypsy moth. Its duties have expanded to include control measures against white pine blister rust; inspection of farms, woodlands and swamps in connection with licensing aircraft application of insecticides; scouting forests to determine abundance of forest insect pests and anticipate outbreaks, and carrying on control activities against insect pests on forage crops.

NOVEMBER, 1953



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As basic producers of minerals, we would like to discuss mineralized fertilizer with you and show you how to increase your fertilizer tonnage and profits by the addition of minerals. We can supply mineral mixtures . . . mixed to your own specifications . . . in large or small quantities.

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ZINC SULPHATE



MANGANESE
SULPHATE



MAGNESIUM
SULPHATE



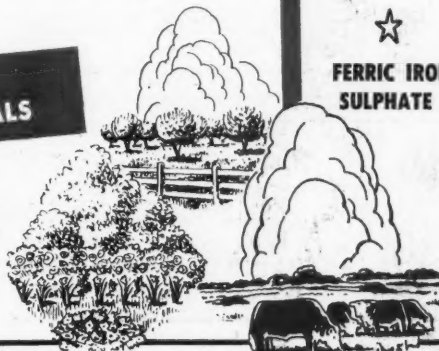
BORON



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SULPHATE

SOLUBLE TRACE MINERALS

Tennessee's trace minerals are soluble and their nutritional value is immediately available to the plant. Soluble trace minerals are more economical and faster acting.



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PHOSPHATE ROCKS and LIMESTONE

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Allentown, Penna.

Dictionary of Fertilizer Materials & Terms

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SOUTHERN STATES PHOSPHATE and FERTILIZER COMPANY

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FERTILIZER MACHINERY and ACIDULATING EQUIPMENT

BATCH MIXERS — PULVERIZERS — CAGE MILLS — SCREENS — SCALES

ELEVATORS, AND ALL OTHER EQUIPMENT FOR COMPLETE PLANTS

ATLANTA UTILITY WORKS

EAST POINT, GA.

Industrial News

11-2 New Automatic Bagger



1. Operator takes empty multiwall bag and holds it on the bag chute.
2. Pre-weighed material drops through chute and filled weight drops the bag onto a moving conveyor which carries it through sewing head.
3. As filled bag moves down conveyor, operator reaches for empty bag.
4. As filled bag goes through sewing head, operator takes a "contents tag" from bin and sews it to bag. Bags then are taken to storage or truck.

If you manufacture a free-flowing, non-bridging material, you'll be interested in the record speed of 18 to 20 100-lb. open mouth multiwall bags per minute set by the new Inglett & Corley Bagger, reports Union Bag & Paper Corp., exclu-

sive sales agent for the machine.

The bagger works in conjunction with a moving conveyor and sewing head. The weighing and filling cycle is completely automatic and begins when the operator pushes the starter button. This automatically delivers the pre-weighed material through the machine's bag chute in an endless series. The filled weight drops each bag onto a moving conveyor belt which carries it through the sewing head.

For further information on the bagger, fill out a Reader Service card, using Code Number 11-2.



Why Breathe Dust?

New G-S safety masks offer full protection, light weight—against non-toxic fumes and sprays. Gauze and fibre filter comfortably secure it over mouth and nose. Wt. 1/2 oz., No. 48A, \$3.60 a dozen, refills \$2.00 per 100. Special: 5 masks and 25 refills for \$2 postpaid.

Hundreds of Other Safety Devices

Is Your Help Protected?

Send now for FREE list of Safety Devices
General Scientific Equipment Company,
Dept. AN Phila. 32, Pa.



Atlas Elects Paget

Richard M. Paget has been elected a director of Atlas Powder Co.

He is senior partner in the management consultant firm of Cresap, McCormick and Paget. During World War II, Paget was on active duty as a management engineer in the Navy department and received the Navy Legion of Merit for his service. He joined the consultant firm upon his return to inactive status in 1946.

Stoddard at Prentiss

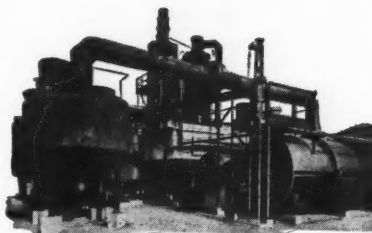
Prentiss Drug & Chemical Co. has appointed John R. Stoddard vice president in charge of insecticide and other agricultural chemical sales.

Frank J. Rush also has joined the Prentiss organization.

Both men formerly were associated with John Powell & Co., Inc., Stoddard as domestic sales manager and Rush, assistant treasurer.

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Industrial News

Phillips Chemical Starts Suit on State Sulfur Tax

Phillips Chemical Co. last month brought suit against the state of Texas in District Court, Austin, regarding the state's \$1.40 per ton sulfur tax.

Texas contends that sulfur produced from sour natural gases by chemical processes is subject to the tax levied on sulfur produced from underground sources.

Basis of the chemical company's suit was that the law doesn't apply

to sulfur produced by chemical means.

Shell Chemical, Gulf Oil and Stanolind Oil did not file suit, but together with Phillips, have paid \$100,000 under protest in taxes on this chemical sulfur.

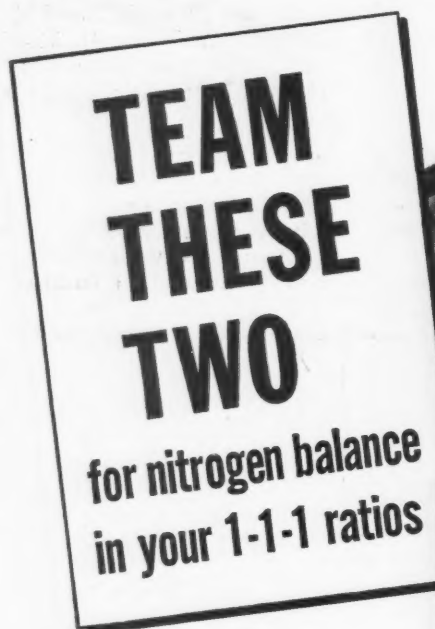
MCA Appointments

The Manufacturing Chemists' Association recently appointed new members to its Public Relations Advisory Committee.

Harry S. Ferguson, vice presi-

dent, Allied Chemical & Dye Corp., has been named chairman to succeed Harold Brayman, director of public relations, E. I. duPont de Nemours & Co., Inc.

New committee members are D. C. Carmichael, Diamond Alkali Co.; Montgomery R. Budd, Hercules Powder Co.; Robert L. Taylor, Mathieson Chemical Corp.; Theodore Marvin, Michigan Chemical Corp. and C. Stuart Hoagland, replacing Henry Young, Interchemical Corp.



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SOLUTIONS**

**SULPHATE
OF AMMONIA**

1-1-1 fertilizer formulas — 8-8-8, 10-10-10, 12-12-12 — are rapidly gaining in popularity among farmers. It's easy to supply both nitrate and ammonia nitrogen in 1-1-1 formulas and other grades of fertilizers by blending the proper amounts of NITROGEN SOLUTION and SULPHATE OF AMMONIA. No other source of nitrogen is needed to make these formulas. This economical team produces mixtures which cure quickly, are more granular, non-dusty and free-flowing — better fertilizers for you and your customers. *Ask our Technical Service Bureau!*

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Atlanta 3, Ga. • Columbia 1, S. C. • San Francisco 3, Calif.



Industrial News

Connecticut Station Tests New Mist Blower

Tests recently were conducted by the Connecticut Agricultural Experiment Station and U. S. Department of Agriculture on a multi-purpose mist blower, which they say is much more adaptable than previous models for applying insecticides.

The 200-pound blower is highly maneuverable, and suitable for treating small orchards, small trees, nursery stock, row crops, grapevines and small fruits, according to the station.

It was developed by a commercial concern with specifications drawn up by S. F. Potts, USDA's Bureau of Entomology and Plant Quarantine; R. A. Spencer and Dr. R. B. Friend, of the experiment station's Entomology department.

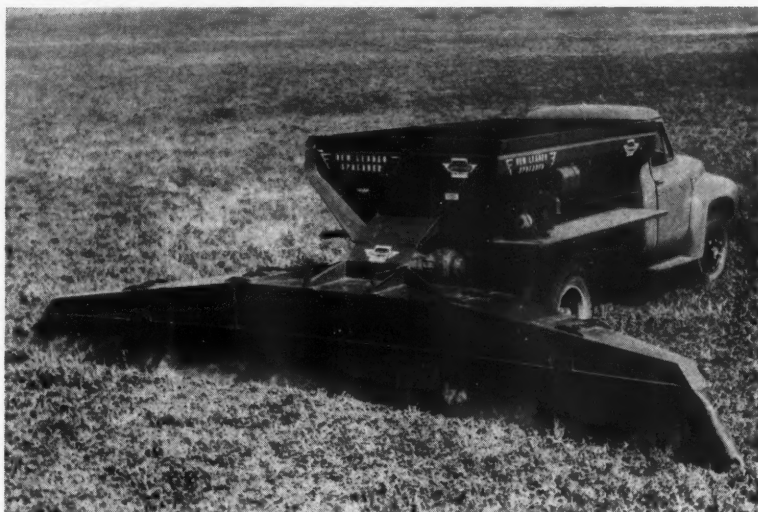
"Tests of a Light-Weight Mist Blower" is the title of Bulletin 572 recently issued by the station, which can be obtained by writing to The Connecticut Agricultural Experiment Station, P. O. Box 1106, New Haven.

Ball Opens Office

Clarence J. Ball has opened his own office at 207 Royster Building, Norfolk, Va. to act as sales agent for fertilizer materials and allied products.

Among others, Ball will represent Bradley and Baker in the promotion and sale of the company's nitrogen products in the North Carolina and Virginia territory.

11-3 Modern Fertilizer Spreaders



Introduction of three 1954 model fertilizer spreaders by Highway Equipment Co. should be of interest to fertilizer manufacturers who do custom spreading.

The 1954 Model New Leader Twin Disc Spreader, Combination Commercial Fertilizer and Agricultural Limestone Spreader and the Super Deluxe Agricultural Limestone Spreader have been carefully redesigned from previous models, states the company, to incor-

porate many new features aimed at increasing ease and efficiency of operation in the field.

Body changes have been made for better weight distribution on modern trucks. The fertilizer attachment hood on the combination spreader as well as the system of attaching to the body is completely new.

For more information, fill out a Reader Service card, using Code Number 11-3.

Arkell Marks Expansion At Open House Program

An open house recently was held by Arkell and Smiths, to mark completion of its \$300,000 expansion program at the Wellsburg,

W. Va. plant.

The several thousand persons in attendance were informed of latest A & S developments and improvements through a packaging clinic directed by R. P. Kessler, the company's packaging engineer.

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- Siglo, Tenn.
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Industrial News

Pink Bollworm Expansion Reported in Texas Area

The largest extension of infested territory ever made under the pink bollworm quarantine was added last month. Fifty Texas counties, seven parishes in Louisiana, seven counties in Oklahoma, an entire Arizona county and part of another, all lightly infested with the pest, were added to the quarantine, according to the U. S. Department of Agriculture.

Because kenaf, a fiber plant recently introduced into this country, has been found to be a host of the pink bollworm, it, along with cotton and its products, may be moved from regulated areas only after meeting treating, inspection and certification requirements.

Although the entire states of Arizona, Louisiana, New Mexico, Oklahoma and Texas are included within the federal pink bollworm quarantined area, only those portions actually infested by the pest are regulated.

Bemis To Build Plant

Bemis Bro. Bag Co. plans to erect a multiwall paper shipping sack manufacturing plant in Wilmington, Cal., with Guy F. Atkinson Co., as contractor.

The new plant will be one story, of concrete tilt-wall construction, with office space, factory and storage areas.

Facilities will be improved and capacity slightly expanded by movement from the present plant location in Wilmington to the new building, at Sanford Ave. and Pacific Coast Highway.

Fertilizer Attachment

A new liquid fertilizer planter attachment kit, which will fit all makes of planters, has been manufactured by H. D. Campbell Co., of Rochelle, Ill.

The kit includes a regular sprayer pump, driven off either power take-off or side mounted and driven off belt pulley, strainers, jets, pressure gauges and sufficient lengths of hose for any type installation.

'Making the Most of a Miracle'

Two years of hard work by officials of the American Plant Food Council and movie consultants have really paid off.

The result of the long efforts, the organization's film "Making the Most of a Miracle," was shown to fertilizer industry leaders and members of the press Oct. 29 in Washington.

Premiere showing of the film was made at a dinner meeting sponsored by APFC in the Sheraton-Carlton Hotel.

The movie, reviewed by FARM CHEMICALS, is excellent in every respect. It utilizes all the latest professional Hollywood techniques, including time-lapse photography and animation, while telling simply and forcefully the story of plant nutrition and the part fertilizers play in it. It is in color, with sound.

Paul T. Truitt, association president, said nationally-known scientists were consulted in the production of the film, which is authentic in every detail.

Louis H. Wilson, director of information, and Dr. John R. Taylor, association agronomist who recently retired, helped in the preparation of the film.

The association hopes the film will "open wider the doors of knowledge to a better understanding of plant growth."

Judging by the praise it received at the special showing, it should go a long way toward helping fertilizer salesmen, farm leaders and farmers appreciate the significance and value of chemical fertilizers.

Tobacco By-Products Now Division of V-C

Tobacco By-Products and Chemical Corp. last month was dissolved as a separate corporation and absorbed as the Black Leaf Products division of Virginia-Carolina Chemical Corp.

C. Bruce Rennie will continue to direct insecticide activities of the firm as general manager of the new division. James R. Arthur will serve as assistant to general manager; James W. Schofield, manager, production department; James M. Merritt, sales manager and Arthur W. Galloway, manager, products development.

The company will continue to market pest control products under the Black Leaf trademark, with production and sales operations merged with those of V-C, according to Virginia-Carolina's president, Joseph A. Howell.

Fertilizer Control Book To Be Printed in January

Official publication No. 7 of the Association of American Fertilizer Control Officials is expected to be completed by Jan. 1.

Included are all official and tentative definitions, copies of talks presented at the seventh annual meeting in Washington, D.C. on Oct. 16, a report of the States Relation Committee, a copy of the eighth draft of the State Model Fertilizer Bill, a summary of state fertilizer laws, list of state control officials and other information.

Orders for the publication, which sells for \$1, are being taken by B. D. Cloaninger, Secretary-Treasurer, Association of American Fertilizer Control Officials, Drawer 392, Clemson, S. C.

Geigy Merges

Geigy Co., Inc. last month merged into its affiliate, Geigy Chemical Corp., and is operating under the name Geigy Agricultural Chemicals, division of Geigy Chemical Corp.

... Dorcco Process

(Continued from page 46)

(1949). The double superphosphate and wet phosphoric acid processes: their present state and future possibilities.

(8) Commercial Fertilizer **84**, 20. 20 April 1952. Also private communication, J. B. Whitney, Chemical Construction Corp., New York.

(9) Lehecke. Developments of Phosphoric Acid Manufacture. Investigations of Nordengren and his Collaborators, Chem. Age. 37:347-350.

Society Discusses Dorcco Process

In the discussion at the Fertilizer Society meeting, following presentation of the paper by Porter and Frisken, several important points were discussed.

Commenting on methods of dealing with the unreacted portion of phosphate rock, Porter said his company was carrying out experiments. He said Fisons had tried removing it from the gypsum by treating it with various strengths

of sulfuric or phosphoric acid, but without much success. He added that treatment with hydrochloric acid might be effective but would be too damaging to the plant. He pointed out that with single superphosphate a proportion of the product also remained unconverted.

American Problems

He told the group that problems of excess or deficiency of silica complained of by American manufacturers might be solved by a proper adjustment of the agitators. In his opinion, the silica content of Moroccan phosphate was sufficient for reaction with the fluorine present in the rock.

Porter declined to suggest the most suitable size of plant for manufacturing the product, commenting that it was a matter for each manufacturer to decide.

Frothing Eliminated

In answer to a question concerning frothing, Porter said a routine washing system dealt effectively

with scale deposits at the Immingham plant.

As to cost, Frisken said that so many external factors affected the comparative cost per unit of triple and single superphosphate that they have been particularly guarded in all their statements on the subject. He repeated that the production of granular material was more complicated than that of powdered and that it was therefore important when considering costs to be sure that like products were being compared.

In Compounds

Asked whether it would be possible to adapt the liquid process, which produced the best granule in the straight product, for the manufacture of compounds, in preference to solid processes, Porter replied that it appeared the granule produced by the liquid process would have to be ground if used in compounds because there would be a good deal of segregation if it were included in its spherical form. ♦

... Fertilizer Control Officials Air Problems

(Continued from page 18)

calcium arsenic with ammonium sulfate.

Chemical reactions between such materials can destroy plant growth, he stated.

An interesting resume of "Present Status of Surface Wetting Agents for Fertilizer Use" was presented by Dr. Sauchelli. His talk covered events in the fast-growing field since a manufacturer reported a year ago that he had used wetting agents with fertilizer mixes to prevent caking.

In summarizing the subject, the Davison research head said the effects of the agents are more physical than chemical and that they may be especially useful during peak production periods to cut down on curing time and make storage space more readily available.

He said the agents are most useful to the manufacturer of superphosphate. Other advantages include less caking, lower moisture content of goods and less fouling of equipment.

A technical presentation of "Progress in Fertilizer Granulation" presented by Hardesty concluded the formal talks.

The USDA official distributed data showing how particle size of fertilizers varied with percentage of plant nutrients.

Distribution of Elements

Hardesty said nitrogen has a tendency to be more evenly distributed in fertilizers, while phosphorus and potash often are unevenly distributed.

He added, however, that his studies have shown that present granulated mixes show a thoroughly uni-

form distribution of nutrients.

A lengthy discussion of the problems connected with combatting "fly-by-night" companies in the fertilizer business which make wild and misleading claims for their products, occupied a major portion of the informal evening session conducted by the States Relations Committee.

On other topics, the men decided that fertilizer companies may guarantee a fourth element in their mixes but that to avoid confusion such a number should not be added to the NPK grade statement.

Informal discussions were held also on the dangers of castor pomace, the need for a method of analyzing fritted trace elements, and experiences of the officials with fertilizer-pesticide mixtures.

In elections to the executive committee of AAFCO, F. W. Quackenbush, Indiana, and J. D. Patterson, Oregon, were chosen to succeed G. W. Michael, Ottawa, Can., and R. W. Ludwick, New Mexico, with terms expiring in 1955.

Both the NFA and the APFC were hosts at banquets honoring the officials, on Oct. 15 and 16, respectively, in the Shoreham. ♦

"He lied about my age," Henry A. Huston, only living charter member of the AOAC, and an honored guest at the NFA banquet for the fertilizer officials, said of Russell Coleman's statement that he is 93. Huston, who has been coming to these meetings for ages, claims the NFA president cheated him out of a year and a half.

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

ALDRIN

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Agricultural Chemical Co., N. Y. C.

AMMONIA—Anhydrous and Liquor

Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Lion Oil Co., El Dorado, Ark.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM NITRATE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Lion Oil Co., El Dorado, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM PHOSPHATE

Monsanto Chem. Co., St. Louis, Mo.

AMMONIUM SULFATE

See Sulfate of Ammonia

AMMONIUM SULFATE NITRATE

Baker & Bro., H. J., New York City

BAGS—Burlap

Bemis Bros. Bag Co., St. Louis, Mo.
McIver & Son, Alex. M., Charleston, S. C.

BAGS—Cotton

Bemis Bros. Bag Co., St. Louis, Mo.
McIver & Son, Alex. M., Charleston, S. C.

BAGS—Multiwall-Paper

Bemis Bros. Bag Co., St. Louis, Mo.
International Paper Co., Bagpak Div., N. Y. C.
Hammond Bag & Paper Co., Wellsburg, W. Va.
Hudson Pulp & Paper Corp., N. Y. C.
Kraft Bag Corporation, New York City
McIver & Son, Alex. M., Charleston, S. C.
Raymond Bag Co., Middletown, Ohio
Union Bag & Paper Corp., New York City

BAGS—Dealers and Brokers

Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES

Fischbein Co., Dave, Minneapolis, Minn.
International Paper Co., Bagpak Div., N. Y. C.

BAG CLOSING—THREAD & TWINE

Bemis Bros. Bag Co., St. Louis, Mo.

BAG PRINTING MACHINES

Schmutz Mfg., Louisville, Ky.

BAG FILLING MACHINES

Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

BHC AND LINDANE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Diamond Alkali Co., Newark, N. J.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Pittsburgh Agricultural Chemical Co., N. Y. C.

BLOWERS

Standard Electric Mfg. Co., West Berlin, N. J.

BONE PRODUCTS

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID

McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOVEMBER, 1953

BROKERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BUCKETS—Hoist, Crane, etc.

Hayward Company, The, New York City

CALCIUM ARSENATE

American Agricultural Chemical Co., N. Y. C.

CARS AND CART

Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

GASTOR POMACE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
McIver & Son, Alex. M., Charleston, S. C.

CHEMISTS AND ASSAYERS

Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Wiley & Company, Baltimore, Md.

CHLORDANE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Agricultural Chemical Co., N. Y. C.

CLAY

Ashcraft-Wilkinson Co., Atlanta, Ga.

CONDITIONERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio

CONTROL SYSTEMS

Sackett & Sons Co., The A. J., Baltimore, Md.

CONVEYORS—Belt

Sackett & Sons Co., The A. J., Baltimore, Md.

COPPER SULFATE

Tennessee Corp., Atlanta, Ga.

COTTONSEED PRODUCTS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

DDT

Ashcraft-Wilkinson Co., Atlanta, Ga.
Diamond Alkali Co., Newark, N. J.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

DIELDRIN

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Agricultural Chemical Co., N. Y. C.

DILUENTS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Agricultural Chemical Co., N. Y. C.
Summit Mining Corporation, Carlisle, Pa.

DITHIOCARBAMATES

Berkshire Chemicals, New York City

DRYERS

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Fairlie, Inc., Andrew M., New York City
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Marietta Concrete Corporation, Marietta, Ohio
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Titlestad Corporation, Nicolay, New York City

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American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.

FILLERS

McIver & Son, Alex. M., Charleston, S. C.

FISH SCRAP AND OIL

Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

FULLER'S EARTH

Ashcraft-Wilkinson Co., Atlanta, Ga.

FUNGICIDES

American Agricultural Chemical Co., N. Y. C.
Berkshire Chemicals, New York City
Tennessee Corp., Atlanta, Ga.

GAS MASKS

Willson Products, Inc., Reading, Pa.

GOOGLES

Willson Products, Inc., Reading, Pa.

HERBICIDES

Diamond Alkali Co., Newark, N. J.
Lion Oil Company, El Dorado, Ark.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

HERBICIDES—Oils

Lion Oil Company, El Dorado, Ark.

HOPPERS & SPOUTS

Atlanta Utility Works, The, East Point, Ga.
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Stedman Foundry and Machine Co., Aurora, Ind.

IMPORTERS, EXPORTERS

Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Berkshire Chemicals, New York City
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES

American Agricultural Chemical Co., N. Y. C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Berkshire Chemicals, New York City
Diamond Alkali Co., Newark, N. J.
Pittsburgh Agricultural Chemical Co., N. Y. C.
U. S. Industrial Chemicals Co., New York City

IRON SULFATE

Tennessee Corp., Atlanta, Ga.

LEAD ARSENATE

American Agricultural Chemical Co., N. Y. C.

LIMESTONE

American Agricultural Chemical Co., N. Y. C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio
Pittsburgh Agricultural Chemical Co., N. Y. C.

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Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Acidulating
Chemical Construction Corp., New York City
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Ammoniating
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Granulating, Fertilizer
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MANGANESE SULFATE
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Spraying Systems Co., Bellwood, Ill.

PARATHION
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Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

PENTACHLOROPHENOL
Monsanto Chemical Co., St. Louis, Mo.

PHOSPHATE ROCK
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PYROPHYLLITE
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International Min. & Chem. Corp., Chicago, Ill.
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U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SUPERPHOSPHATE
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Baker & Bro., H. J., New York City
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Sackett & Sons Co., The A. J., Baltimore, Md.

ZINC SULFATE
Tennessee Corp., Atlanta, Ga.

FARM CHEMICALS



Safety posters prepared by NSC's Fertilizer Section.

For fertilizer plants—

Safety Posters

ONE of the most active groups in the fertilizer industry is the Fertilizer Section of the National Safety Council.

Formed only a few years ago by several enthusiastic men who wanted to do something about the alarming accident rate in the industry—one of the highest rates in the country—it has done much to promote safety.

The section has sponsored safety meetings regularly in various parts of the country to bring the cause of safety to the attention of top management and safety directors in the industry.

Now the group has prepared a set of 12 safety posters aimed at bringing safety to the attention of workers.

The posters, measuring 8½ by 11¼ inches, and printed in two colors, show graphically the dangers that can befall careless employees in your plant.

J. Lauren Shopen, in charge of public relations for the section says his group feels that fertilizer management will be greatly interested in buying the bulletins, which are slanted directly at the field. Prices to members for sets of 12 posters are as follows:

- 1 to 9 sets—\$2
- 10 to 99 sets—\$1.85
- 100 and over sets—\$1.75

The posters cover such topics as blasting, use and repair of guards, dockboards, materials handling trucks, plant housekeeping and other safety points.

Price of the sets to non-members of the section is somewhat higher, according to Shopen, whose address is Consumers Co-op Association, Box 2359, Kansas City, Mo. ♦

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Tolerances Coming?

ALL things come to him who waits. Our exclusive column from Washington this month indicates that pesticide manufacturers soon may realize the truth of that statement.

John Harms and Fred Bailey, our correspondents covering the Washington scene each month, report that residue tolerances for pesticides used on fruits and vegetables may be announced by the end of 1953 by Secretary Oveta Culp Hobby, of the Department of Health, Education and Welfare.

After a three-year wait, during which time the pesticide industry all but implored the government to come forward with the promised tolerances, it now appears they will be issued just after the industry had given its full support to the Miller bill, which is intended, in part, to remedy the need for tolerances.

Whether the tolerance announcement is intended by Madam Hobby to influence the outcome of the Miller bill, and whether the order actually will be released, still is uncertain. But it will bear watching during the next few months by industry members.

* * * * *

A FEW months ago some pesticide and fertilizer industry leaders expressed concern over impending acreage allotments as a detriment to farm chemical usage.

The allotments have now been announced by USDA (wheat and cotton are the only major crops scheduled for early cutbacks) but there are several reasons for an optimistic outlook on fertilizer and pesticide usage next year:

1. *With limited acres, farmers will have an added incentive to use a maximum amount of fertilizers to produce the biggest possible yield on their available land.*
2. *The acres the farmer chooses for his restricted crops undoubtedly will be the best available—the kind he uses most fertilizer on in normal years.*
3. *The surplus acres—the ones ordinarily used for wheat or cotton production—will be utilized for alternate crops by the wise farmer. That of course means fertilizers will be needed to grow the crops and pesticides to protect them.*

A bigger worry to industry members has been the

prolonged drought which put a dent in fertilizer and pesticide sales during the last half of the summer and currently is holding applications for winter wheat down almost to nil.

No one, in or out of the farm chemicals industry, has any solution to the drought situation; however here too, there seems to be no real cause for alarm. Most agricultural leaders we've talked to believe that fertilizer usage, for wheat especially, will spurt with the spring rains (provided, of course, there are any.)

Fertilizer and pesticide usage continued on the upswing this year, despite all the drawbacks. Paul T. Truitt, APFC president, estimated at the recent meeting of the American Association of Fertilizer Control Officials that tonnage of fertilizer consumption was up five per cent over 1952 and that percentage of plant nutrients was up 10 per cent, because of the trend toward higher analysis mixes.

Pesticide industry members generally are agreed that sales of their products showed a slight increase in volume but that huge inventories and sharp price reductions eliminated any possibility of profits.

* * * * *

THE fertilizer industry has lost two good men; both trade association officials.

Within a few weeks of each other, the resignations of Bill Chace from the National Fertilizer Association and "Dugan" Taylor from the American Plant Food Council were announced by the groups.

One of the positions was filled immediately when Delbert L. Rucker was named to fill Chace's NFA position as director of information. As yet no successor to Taylor as APFC agronomist has been announced.

Industry members who turned to Chace and Taylor during the last seven years for information or advice know of the fine job they did in their respective positions.

Industry press members are especially thankful for the cooperation and help they got from the men on problems that regularly face an editor trying to do a thorough job in covering the fertilizer trade.

Farm Chemicals wishes Chace and Taylor success in their new jobs and welcomes Rucker, who is well qualified by experience to step into this fast-moving industry.

—HAMILTON C. CARSON



It's Complete Coverage

The repeated application of high quality fertilizers permanently insures our crop and pasture lands.

Potash Company of America, producers of finest quality red muriate, is proud of its part in this soil insurance.

POTASH COMPANY of AMERICA Carlsbad, New Mexico

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Midwestern Sales Office . . . First National Bank Bldg., Peoria, Ill.

Southern Sales Office . . . Candler Building, Atlanta, Ga.

Sul-Po-Mag®

WATER-SOLUBLE ($K_2SO_4 + 2MgSO_4$)
DOUBLE SULFATE OF POTASH-MAGNESIA

**CONTAINS SOLUBLE MAGNESIUM
THE FOURTH ELEMENT**

LIBRARY UNIVERSITY FARM,
ST. PAUL,
MINNESOTA. ZONE-8



put it in the bag— put it on the bag

They're talking about it . . . about soluble magnesium, the fourth plant food element in the fertilizer bag.

Dealers are talking about it, recommending it because soluble magnesium gives them a better quality product to sell in large volume.

Farmers are talking about the higher yields, finer quality, greater acre profits obtained when they use fertilizers containing soluble magnesium.

Experience shows that the most practical and economical way to include soluble magnesium in mixed fertilizer is with International's Sul-Po-Mag.

Sul-Po-Mag is a properly balanced combination of sulfate of magnesium and sulfate of potash. Both are water-soluble and immediately available to growing crops. *Sul-Po-Mag* is produced exclusively by International at Carlsbad, New Mexico, in bulk for mixed fertilizers and bagged for direct application.

Farmers and dealers look to you for fertilizers that are properly balanced with the nutrients required for profitable crop production. So include *Sul-Po-Mag* to supply soluble magnesium—the fourth element. Put it in the bag—put it on the bag: Nitrogen, Phosphate, Potash, Magnesium.



MURIATE OF POTASH • SULFATE OF POTASH • SUL-PO-MAG

Mined and Refined at Carlsbad by International Fertilizer Manufacturers

Potash Division

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